BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 12 1944

STUDIES ON HEPATIC DYSFUNCTION

I. CARBON TETRACHLORIDE POISONING TREATED WITH CASEIN DIGEST AND METHIONINE

BY

J. BEATTIE, M.D., D.Sc.
Bernhard Baron Research Professor, Royal College of Surgeons of England

P. H. HERBERT, B.A.
Leverhulme Scholar, Royal College of Surgeons of England

C. WECHTEL, M.D. AND **C. W. STEELE, M.D.**
Capt., U.S. Army Medical Corps *Major, U.S. Army Medical Corps*

(From a U.S. Military Hospital, E.T.O., and the Bernhard Baron Research Laboratories, Royal College of Surgeons of England)

The interest of the case recorded below lies in the successful use of a method of treatment not hitherto applied to man. It was felt that the following considerations, which seemed to indicate a probably fatal outcome, justified its adoption: (1) The large quantity of carbon tetrachloride alleged to have been swallowed—30 to 40 ml. The maximum therapeutic dose is 4 ml., but fatalities have been reported with doses as low as 1.5 ml. (2) The probably complete absorption of the drug. Immediate symptoms indicated a rapid entry into the circulation. Vomiting was not induced until 45 minutes after ingestion. (3) The speed with which the liver enlarged. (4) The delay of 19 hours between the accident and the institution of treatment.

Case History

An Army Air Force sergeant-pilot (white) aged 23 ingested by mistake "two large swallows" of carbon tetrachloride at 4.15 p.m. on Oct. 2, 1943. The quantity was determined later to be between 30 and 40 ml. No food had been taken since breakfast at 7.15 a.m. The patient noted an immediate "hot burning sensation" in his "throat and stomach." He became rapidly "dizzy and light-headed," but was able to walk with assistance to the camp infirmary. At 4.35 p.m. he was given large quantities of salt and water by mouth to induce vomiting. This did not occur until 45 minutes after the accident, and was not repeated. The medical officer observed that at this time the patient was confused mentally, and subsequent questioning revealed that there had been a loss of memory of events between his arrival at the camp infirmary and his transfer to hospital at 6.30 p.m. On admission to hospital he was put to bed and given 1½ gr. of luminal to alleviate his apprehension and restlessness. He was still dizzy and nauseated throughout the night, but vomited only once. He refused food on the evening of admission and on the morning of the following day—Oct. 3.

At 11 a.m. on Oct. 3 he came under our observation. One of us (W.) examined the patient, who was restless and complained of dizziness. Jerking movements of the limbs and rolling of the head from side to side were observed. The pharynx was red and injected. Abdominal palpation revealed a tender liver with rounded edge. This edge extended 2 in. below the costal margin in the right anterior axillary line and 1½ in. below the costal margin in the left anterior axillary line. It was also palpated 1½ in. above the umbilicus. All these and subsequent measurements were taken during normal respiration, and were confirmed by three observers. No other abnormal signs or symptoms were noted.

At 12.30 p.m. the patient was given 2 g. of *dl*-methionine by mouth. This was retained. At 3.30 p.m. 1 ml. of a casein-digest–methionine solution was injected slowly into an antecubital vein. There was no immediate reaction. Five minutes later 5 ml. was injected, also without reaction. Continuous infusion of the solution by a Murphy drip apparatus was begun immediately. The rate of infusion was about 2 ml. a minute. At 6.30 p.m., when 436 ml. of the solution had been infused, the patient complained of chilliness, intense headache and backache, and some aching of the limb muscles. The pulse was thin and the lips slightly cyanotic; the blood pressure was 130/20. Infusion was stopped, hot-water bottles and extra blankets were applied, and 5 gr. of an aspirin-codeine mixture was given. One hour later the colour had improved, the aching had been relieved, and the blood pressure was 120/88. The temperature was 100.8° and pulse 100.

At 6 p.m. it was noted that the liver was still tender and had enlarged considerably. The edge, which was rounded, had reached the level of the umbilicus on the middle line and was between 2½ and 3 in. below the costal margin in the anterior axillary line. At 7 p.m. the patient was given a small meal, which he ate and retained. Nausea, dizziness, headache, and muscle aching had disappeared before 11 p.m. The night was uneventful.

At 9 a.m. on Oct. 4 the patient was mentally alert and made no complaints. Abnormal muscle movements, dizziness, headache, and nausea were absent. The liver was no longer tender on palpation. The edge, which had now become sharp and firm, was half an inch below the costal margin in the right and left anterior axillary lines. He ate all the food placed before him during the day and said his appetite was good. He had a good night.

At 8 a.m. on Oct. 5 he complained that his dizziness and headache had returned. He felt tired and devoid of energy, and his appetite was poor. He was not nauseated and had no abdominal discomfort. The alertness noted on the 4th had been replaced by apathy and listlessness. Questions were answered slowly and with effort. Abdominal palpation revealed that the liver had again enlarged. The edge was rounded, soft, and tender. It was felt one inch below the costal margin in the right anterior axillary line. The spleen was palpable. At 9 a.m. 2 g. of methionine was given by mouth and another 2 g. at 7 p.m. All food presented was eaten. There was no elevation of temperature, pulse, or respiration rate. By 7 p.m. he stated that he felt better. The night was uneventful.

The following morning (Oct. 6) the patient was alert and made no complaints. He said he had a good appetite and expressed a desire to return to duty. Abdominal palpation showed that the liver had again retracted and was palpable about half an inch below the right costal margin on deep inspiration. The liver edge was firm, sharp, and not tender. The spleen could not be palpated.

The patient was retained for observation until Oct. 14, during which time he was symptom-free and received no medication. At no time during the period of observation was icterus noted. The liver was palpable only on deep inspiration during the whole of the period from Oct. 6. He was discharged as fit on Oct. 14 and returned to full duty with his squadron. Between that day and Nov. 2 he was on normal operational flights over enemy-occupied territory. On Nov. 2 he was readmitted for observation. He made no complaints, had an excellent appetite, and said he had been fit since his discharge on Oct. 14. Examination revealed no abnormal signs or symptoms. His liver edge could be palpated only on deep inspiration. It was not tender.

During the period of observation all food given was weighed and its nitrogen and sulphur content estimated from the tables of

McCance and Widdowson (1940). The daily diet contained 100 g. of protein, of which three-quarters was of animal origin. The calorie content of the diet varied between 2,800 and 3,000. The diet was low in fat.

Comment on Treatment

Miller and Whipple (1942) showed that fatal liver damage was produced by 30 minutes of chloroform anaesthesia administered to dogs which had been kept on protein-deficient diets for several weeks before. This damage was averted if within 3 to 4 hours after anaesthesia 3 g. of methionine in solution was injected into the circulation. The effect of carbon tetrachloride on the liver is comparable to that produced by chloroform. As our patient was a physically fit young airman whose diet was rich in protein it seemed possible that a massive dose of methionine intravenously might be effective despite the relatively long time which had elapsed since the accident. The small oral dose of methionine (2 g.) was administered pending the preparation of a solution for intravenous infusion.

The infusion was prepared by dissolving 20 g. of a dried papain-trypsin digest of casein in 600 ml. of distilled water. The solution was acidified, and to it was added 15 g. of *dl*-methionine. It was then boiled and filtered. The final *p*H was 7.6 and the solution was approximately isotonic. It was tested by injecting 20 ml. into the ear vein of a rabbit. No effect was observed within a period of two hours.

The original intention was to administer 15 g. of methionine. This dose was calculated on the basis of 0.25 g. per kg. of body weight, which was approximately the dosage used by Miller and Whipple. In fact, only 9.5 g. was infused, and 2 g. was given by mouth on Oct. 3. Casein digest was added to the solution because it was thought that amino-acids other than methionine might be of some value. As Miller and Whipple had secured good results in their experiments by a single massive dose of methionine it was decided to give no methionine during Oct. 4. The relapse on the 5th, which was treated by giving 4 g. of methionine by mouth, suggested either that our dosage of methionine on the 3rd was too small or that small doses of methionine should have been administered on two or three days after the original massive dose.

The febrile reaction observed in our patient was similar to those reported by other observers (Martin and Thompson, 1943) after infusion of amino-acids. Such reactions are due apparently to too rapid infusion of the amino-acid solutions. It was unfortunate, therefore, that in our patient the rate of infusion was rapid enough to bring on the reaction. A slower infusion might have resulted in the injection of all the solution without reaction, and possibly might have averted the relapse on the 5th.

Laboratory Investigations

Haematology.—Three blood counts were carried out. The results of these are given in Table I. The raised white count on the 3rd with 74% polymorphonuclear cells was followed three days later by a fall in the white count to 10,500 with a marked rise in the percentage of lymphocytes. There was no significant rise, however, in the total number of lymphocytes. The blood picture almost a month later showed that the lymphocytes had been little affected, and the rise in the white count must be attributed to a rise in the polymorphs. The red cell count calls for no special comment.

TABLE I

Date	R.B.C.	Hb%	W.B.C.	Polymorphs (%)	Lymphocytes (%)	Monocytes (%)	Eosinophils (%)
Oct. 3	5,030,000	100	16,600	74	24	1	1
,, 6	5,480,000	—	10,500	53	44	3	—
Nov. 2	5,320,000	100	13,700	61	34	4	1

Blood Chemistry.—The various determinations are listed in Table II and commented on later.

Urine.—All urine passed after 12 noon on Oct. 3 was collected. Routine tests for albumin, sugar, bile, and urobilinogen were carried out twice daily. Except for the presence of a trace of sugar and a positive urobilinogen reaction in the sample collected between 7 p.m. on the 4th and 7 a.m. on the 5th no abnormality was noted. No acetone bodies were found in this sample. A few red and white blood cells were seen in the sample collected between 3.30 p.m. on Oct. 3 and 7 a.m. on the 4th. No casts were seen in any specimen.

TABLE II

Date	Time	Serum Bilirubin (mg./100 ml.)	Blood N.P.N. (mg./100 ml.)	Blood Amino-N (mg./100 ml.)	Total Cholesterol (mg./100 ml.)	Total Protein (g./100 ml.)	A./G. Ratio
Oct. 3	12.30 p.m.	1·10	33	6·4	172	7·3	2·0
,, 3	3.30 p.m.	1·30	34	8·7	165	7·5	2·2
,, 3	6.30 p.m.	1·90	34	12·7	137	—	—
,, 4	6.30 p.m.	0·80	30	5·6	136	7·3	1·9
,, 6	8 a.m.	0·88	31	5·2	195	—	—
,, 13	8 a.m.	1·00	34	4·9	212	7·4	1·8
Nov. 2	8 a.m.	1·10	39	4·8	197	—	—

The daily urinary output of nitrogen, sulphur, creatinine, and "total creatinine" was estimated. The values obtained are listed in Tables III–VI. The significance of these findings is discussed below.

TABLE III

Date	Urine Vol. (ml.)	Urinary Creatinine (g.)	Total Creatinine (g.)	Total Urinary Nitrogen (g.)
Oct. 3	1,588	1·06	1·12	7·77
,, 4	2,730	1·97	2·06	20·64
,, 5	1,810	1·55	1·57	12·10
,, 6	2,420	1·86	2·08	14·64
,, 7	2,210	2·06	2·14	14·78
,, 8	2,120	2·01	2·26	14·76
,, 9	1,860	2·08	2·10	13·18

The specimen listed for Oct. 3 was collected between 12 noon on that day and 7 a.m. on Oct. 4. All other specimens were from 7 a.m. to 7 a.m., and are listed under the date on which collection started.

TABLE IV.—*Nitrogen Balance*

Date	Input as Grammes N_2			Urinary Output (g. N_2)	Balance
	Food	Methionine and Digest	Total		
Oct. 3	4·8	2·1	6·9	7·8	−0·9
,, 4	14·3	—	14·3	20·6	−6·3
,, 5	16·4	0·4	16·8	12·1	+4·7
,, 6	16·9	—	16·9	14·6	+2·3
,, 7	15·7	—	15·7	14·8	+0·9
,, 8	16·3	—	16·3	14·8	+1·5
,, 9	17·1	—	17·1	13·2	+3·9
	101·5	2·5	104·0	97·9	+6·1

The period listed as Oct. 3 covers the hours between 12 noon on the 3rd and 7 a.m. on the 4th. All other periods are between 7 a.m. and 7 a.m., and are listed as belonging to the day on which collection of urine began.

TABLE V.—*Sulphur Balance*

Date	Input as Grammes S_2			Urinary Output (g. S_2)	Balance
	Food	Methionine and Digest	Total		
Oct. 3	0·33	2·57	2·90	1·00	+1·90
,, 4	0·97	—	0·97	2·65	−1·68
,, 5	1·09	0·86	1·95	1·01	+0·94
,, 6	1·07	—	1·07	1·08	−0·01
,, 7	1·01	—	1·01	0·99	+0·02
,, 8	1·01	—	1·01	0·97	+0·04
,, 9	1·03	—	1·03	0·73	+0·30
	6·51	3·43	9·94	8·43	+1·51

TABLE VI.—*Sulphur Partition in Urine*

Date	Total S_2 (g.)	Total Sulphate S_2 (g.)	Neutral S_2 (g.)	% Neutral S_2
Oct. 3	1·00	0·67	0·33	33·0
,, 4	2·65	1·30	1·35	51·0
,, 5	1·01	0·77	0·24	23.8
,, 6	1·08	0·98	0·10	9·3
,, 7	0·99	0·91	0·08	8·1
,, 8	0·97	0·89	0·08	8·3
,, 9	0·73	0·67	0·06	8·2

Methods.—Serum bilirubin estimations were carried out by Gibson and Goodrich's (1934) modification of van den Bergh's method. Non-protein nitrogen was determined in a Folin-Wu

filtrate of whole blood, as was the amino-nitrogen. The former determination was done by the method of Folin and Wu (1919), and the latter by van Slyke's method (1929). Blood cholesterol levels were determined by Leiboff's method (1924), the blood proteins by Andersch and Gibson's (1933) modification of Wu and Ling's method. Urinary nitrogen was determined by the Kjeldahl method, and the creatinine and "total creatinine" by the colorimetric method of Folin (1914). The total sulphates (inorganic plus ethereal sulphates) were estimated by the method of Folin (1905). Some difficulty was experienced in obtaining consistent results in total sulphur estimations until a method after Pirie (1932) was used. Estimations on each individual sample were repeated until a constant value was obtained. To check these results a pooled sample made from proportional parts of each daily sample was prepared and the sulphur content estimated. The final value obtained from the pooled sample was within 2% of the sum of the values from the individual samples.

Comment on Laboratory Investigations

The first abnormality revealed by the routine investigations was the rise in the serum bilirubin level between 12.30 p.m. and 6.30 p.m. on Oct. 3—i.e., during the period when the liver was enlarging rapidly. Apart from the rise in blood amino-nitrogen at the end of the period of infusion and the transient appearance of urobilinogen on the day when relapse occurred, the routine investigations showed no other significant abnormality. It is of interest to note that the serum bilirubin on Nov. 2 had remained at the same level as on the day before discharge (Oct. 13).

In addition to these routine tests an attempt was made to follow the mode of action of methionine by estimating the nitrogen and sulphur balances of the patient and by determining the partition of the urinary sulphur between the oxidized (total sulphate) and unoxidized (neutral) fractions. It would appear from the balance figures that there was a nitrogen retention of 6 g. over the whole period. This may well be accounted for by nitrogen loss in the faeces. It should be noted, however, that on the 3rd and 4th there was a total negative balance of 7 g., which was almost eliminated by the sum of the positive balances of the 5th and 6th. While it is difficult to believe that the negative balance represents the rapid destruction of cellular elements followed by an equally rapid replacement, it may well be that on the 3rd and 4th the processes of protein synthesis in the liver were impaired, but returned to normal on the 5th and 6th and continued so during the rest of the period of observation.

The positive sulphur balance is, however, proportionately much greater. Even when a 5% error in estimated intake, a faecal loss of 10%, and an error of 2% in the total urinary sulphur estimations are deducted from the positive balance, there is still a small amount of sulphur unaccounted for. Since it is unlikely that all these factors operate at a maximum value and in the same direction the retention of sulphur is probably significant.

That the liver damage was in the nature of a metabolic derangement rather than an actual destruction of liver substance is indicated by the partition of the urinary sulphur. We have not yet followed the metabolism of large quantities of methionine given intravenously to normal individuals. Medes (1937), however, has shown that of 3.2 g. of *dl*-methionine given orally to normal individuals 95% is oxidized to sulphate and excreted in the urine within 24 hours, causing no appreciable rise in the unoxidized sulphur fraction. As it has also been shown by Martin and Thompson (1943) that amino-acids injected at the rate of 10 g. an hour do not spill over into the urine, it is safe to assume that a normal individual receiving the same treatment as our patient would have excreted in the urine the major portion of the methionine sulphur as oxidized (total sulphate) sulphur within 24 hours. The rate of injection of the solution used in our patient was almost identical with that quoted by Martin and Thompson. Our patient, however, excreted an excessive amount of unoxidized sulphur during the first two days, a quantity which was roughly equivalent to 65% of the amount of sulphur given therapeutically as methionine. While there is a possibility that some of the unoxidized sulphur excreted on the first day might be due to spill-over into the urine, this cannot be true of that excreted on the second day. Moreover, a similar phenomenon was noted on the day of relapse, when the methionine was given orally. Thereafter the neutral sulphur fraction was within the usually accepted normal limits.

These considerations lead us to believe that the intimate cause of the liver disturbance induced by carbon tetrachloride is an abnormal metabolism of methionine and related compounds, and, moreover, that in our patient it was specifically the administration of methionine which prevented further liver damage. We hope to be able to determine the degree of permanent liver damage, if any, and the patient's reponse to large doses of methionine when he is readmitted to hospital for investigation at the end of six months.

Summary

The history of a case of acute carbon tetrachloride poisoning has been presented.

The patient was treated successfully by *dl*-methionine administered partly by infusion and partly by mouth.

An attempt has been made to follow the metabolism of the methionine administered.

We wish to express our thanks to Col. Middleton and Col. Hatcher, U.S. Army Medical Corps, for putting hospital and laboratory facilities in a U.S. Military Hospital at our disposal. We are grateful to Dr. M. Smith and Miss W. Watts for their assistance with the laboratory investigations, to Miss Eisendorff for superintending the dietetic work, and to the ward and laboratory staffs for their co-operation. We wish to thank the Research Department of British Colloids Ltd. for providing generous samples of casein digests suitable for intravenous injection.

REFERENCES

Andersch, M., and Gibson, R. B. (1933). *J. lab. clin. Med.*, **18**, 816.
Folin, O. (1905). *J. biol. Chem.*, **1**, 131.
—— (1914). Ibid., **17**, 469.
—— and Wu, H. (1919). Ibid., **38**, 81.
Gibson, R. B., and Goodrich, G. E. (1934). *Proc. Soc. exp. Biol.*, N.Y., **37**, 413.
Leiboff, S. L. (1924). *J. biol. Chem.*, **61**, 177.
McCance, R. A., and Widdowson, E. M. (1940). Med. Res. Cncl. Sp. Rep. Ser. No. 235.
Martin, G. J., and Thompson, M. R. (1943). *Medicine*, **22**, 73.
Medes, G. (1937). *Biochem. J.*, **31**, 1330.
Miller, L. L., and Whipple, G. H. (1942). *J. exp. Med.*, **76**, 421
Pirie, N. W. (1932). *Biochem. J.*, **26**, 2041.
van Slyke, D. D. (1929). *J. biol. Chem.*, **83**, 425.

A CLINICAL EVALUATION OF SOME TESTS OF LIVER FUNCTION

BY

G. HIGGINS AND J. R. P. O'BRIEN
Department of Biochemistry, University of Oxford

ALICE STEWART AND L. J. WITTS
Nuffield Department of Clinical Medicine

(Radcliffe Infirmary, Oxford)

Before biochemical tests are accepted for the diagnosis or assessment of disease of the liver in man they should conform to certain conditions. First, it is essential to know the extent of the normal variations. To do this the tests must be applied to a large number of healthy men and women of different ages. Secondly, the tests should be applied in proved disease of the liver to show their sensitivity. To be satisfactory the results should differ materially from those found in the normal series. Detailed analysis might also reveal points by which one could distinguish between the various forms of liver disease and judge the severity of the liver damage. Thirdly, the tests should be applied in other diseases to show how specific they are.

Only when tests have been considered from these standpoints can they justifiably be applied to unselected clinical material. Although obvious, these criteria have often been ignored in the past, and even now are not fully appreciated. The number of observations on control cases is often small, and the worth of the tests in the diagnosis of disease of the liver is often open to doubt. Applied to cases in which the diagnosis is uncertain, they have given abnormal findings which have led to the assumption that the patient is suffering from disease of the liver. Then, by a familiar logical fallacy, it

is argued that the tests are good tests because they have revealed disease of the liver. In the work here presented a determined effort has been made to break this vicious circle and to put the first two conditions of validation on a sound statistical basis. Final proof of the exact specificity of the tests would include repeating them in every known disease. This is clearly impossible, but the tests have been done in a large group of miscellaneous diseases.

The biochemical investigations reported here are part of a much larger study of pigment metabolism (O'Brien, 1944), and only those immediately concerned with liver function are given. These are attempts to assess the efficiency of the liver in performing certain biochemical activities ascribed to it, and include tests to demonstrate the part it plays in carbohydrate metabolism and protein synthesis, and its ability to secrete, excrete, and detoxify certain organic compounds. The following estimations were made:

Plasma Bilirubin : Colorimetric (Thannhauser and Andersen, 1921)

Plasma Phosphatase : Colorimetric (King and Armstrong, 1934)

Plasma Proteins : Micro-Kjeldahl (Howe, 1921)

Hippuric Acid Test : Titration (Probstein and Londe, 1940)

Modified Laevulose-tolerance Test : Colorimetric (Higgins, O'Brien, and Stewart, 1942). The laevulose index is derived from this test.

100 individuals—50 males and 50 females between the ages of 18 and 50 years, all university students or laboratory personnel—were used as controls.

Diseases of the Liver

The patients studied comprised all suitable cases of disease of the liver admitted to the Radcliffe Infirmary during the past three years. Many of the patients were kept under continuous observation, and the tests were repeated during the course of the illness. The others were made the subject of a special follow-up investigation in the summer of 1943. Several of the patients who had recovered were re-examined some months after their discharge from hospital. Biochemical data were completely disregarded in making the diagnosis, which was founded on clinical criteria. The following diseases are represented:

Secondary Carcinoma of the Liver (16 Cases).—The diagnosis was confirmed either at operation or at necropsy. For the purpose of statistical analysis two groups are recognized—one with intense jaundice due to extrahepatic obstruction (9 cases), and one in which there was no compression of the large bile ducts (7 cases).

Acute Hepatitis (22 Cases).—These were all cases of acute parenchymatous disease of the liver in which the illness was of short duration. Fifteen were probably cases of infective hepatitis, and one developed jaundice after an operation for appendicitis and intensive sulphonamide therapy. There were three cases of post-arsphenamine jaundice, two cases of Weil's disease, one of which was fatal, and one fatal case of acute hepatitis of unknown aetiology. Post-mortem examination in the two fatal cases showed acute diffuse hepatitis with no residual scarring.

Subacute Hepatitis (19 Cases).—These were cases of hepatitis with jaundice in which the illness lasted longer than two months. In every instance jaundice was the presenting sign, and investigation excluded the presence of gall-stones or neoplasm. Eight patients died, six showed complete clinical recovery at the time of the follow-up, and five were still suffering from recognizable liver disease. Post-mortem examination was made in all the fatal cases, and revealed massive necrosis with scarring and nodular hyperplasia.

Of the six patients who recovered two were cases of post-arsphenamine jaundice, one had been exposed to T.N.T., and three were probably cases of infective hepatitis.

Three of the eight patients who died had had previous attacks of jaundice, diagnosed at the time as infective hepatitis. One had worked in a laundry and handled trichlorethylene for a number of years. There was no clue to the aetiology in four of the cases.

The five patients who showed progressive disease of the liver but were alive at the time of the follow-up included one who had used carbon tetrachloride as a cleaning agent for many years. He had a mild attack of jaundice while on holiday. He returned to work immediately afterwards, but continued to feel ill, and two months later the jaundice recurred. One patient dated his illness from an attack of jaundice that occurred during an epidemic of infective hepatitis, and he gave a definite history of contact at this time. There was no clue to the aetiology in three of the cases.

Cirrhosis or Chronic Hepatitis (14 Cases).—The onset of the illness in this group was insidious and not marked by any recognizable clinical event. The disease either was discovered accidentally in the course of investigating other conditions or was first seen when symptoms of portal hypertension or terminal liver failure had developed. In every case the liver was inspected either by laparoscopy or laparotomy or at necropsy. One patient gave a history of syphilis and one had haemochromatosis. Both these patients died, and the diagnosis was confirmed post mortem. Three were chronic alcoholics, one of whom also took drugs. One had been treated for epilepsy with Fowler's solution for several years. Six of the fourteen patients died. The tests were repeated in six of the eight who were alive at the time of the follow-up. The essential pathological lesion in the fatal cases was diffuse periportal fibrosis with minimal parenchymatous hyperplasia.

The cases of subacute hepatitis that failed to recover often presented in the later stages of their illness a clinical picture which was indistinguishable from that of cirrhosis. We have used the presence or absence of jaundice early in the disease as the clinical distinction, but it is possible that there is no hard-and-fast line between these two groups. On the other hand, the subacute cases that recovered resembled the cases of acute hepatitis in every respect except that the jaundice was more prolonged. The impression gained from the survey as a whole is that in diffuse hepatitis, as in glomerulo-tubular nephritis, every grade of chronicity exists, but for purposes of classification and statistical analysis the subdivision into acute, subacute, and chronic hepatitis is convenient, and enables one to relate the biochemical abnormalities to the clinical course and prognosis.

Diseases of Other Systems

Investigations were made in 62 cases of illness other than disease of the liver. The following disease groups were represented:

	Cases		Cases
Anaemia	18	Ulcerative colitis	2
Secondary syphilis	7	Type II nephritis	2
Reticulosis	6	Hypertension	2
Thyrotoxicosis	5	Myelomatosis	2
Diabetes	5	Polycythaemia	1
Peptic ulcer	4	Arsenical dermatitis	1
Ascites from other causes	3	Lung abscess	1
Carcinoma	3		

Results

The results from all three groups are summarized in Table I, which gives the mean value and the standard error of the mean for each test. Table II gives a more detailed analysis of the tests in the liver diseases.

1. Normal Controls

The complete battery of tests was done on every individual. This is one of the largest control groups for this series of tests yet reported, and should give reliable information regarding the range of values in the healthy adult population living under the wartime conditions of 1942. The results are being reported in detail elsewhere (Higgins and O'Brien, 1944).

2. Disease of the Liver

Plasma Bilirubin.—Both the fatal cases of acute hepatitis were intensely jaundiced. This was also a feature in the early weeks of the illness in the more severe cases of acute and subacute hepatitis that eventually recovered. The last group contained two gravely ill patients in whom the bilirubin was over 20 mg. per 100 c.cm. when first seen. These bilirubin values cannot properly be compared with the ones found in the cases of subacute hepatitis that failed to recover, because these patients were often not sent to hospital until several months after the jaundice had first appeared. None of the cases of cirrhosis gave a history of a previous attack of jaundice, and even in the terminal stages of this disease a rise in the plasma bilirubin of more than 2 or 3 mg. was exceptional. As might be expected, there was intense bilirubinaemia

in the cases of carcinoma with extrahepatic obstruction, and only moderate jaundice in those in which there was none.

Plasma Phosphatase.—The average value for the plasma phosphatase was above normal in each group. The two fatal cases of acute hepatitis gave values of 18 and 22 units respectively. In the cases of hepatitis that recovered the level of the plasma phosphatase ranged from 10 to 54 units at the height of the illness, with a mean value of 24 units. In every case except one the level returned to normal when the patient recovered. The exception was a boy with subacute hepatitis. His plasma phosphatase was still 35 units six months after the beginning of the illness. Variable results were obtained in the cases of subacute hepatitis that failed to recover. The average value was 26 units, but there was a wide scatter and no close correlation between the level of the plasma phosphatase and the clinical condition. In six of the thirteen cases it was below 20 units when first seen, and low values were found in the terminal stages of three of the fatal cases. Four cases of cirrhosis gave values of less than 20 units when first admitted, but the average value, 36 units, was much higher than in the other types of hepatitis. When the tests were repeated at the time of the follow-up only one case of cirrhosis gave a value of less than 40 units. In the cases of carcinoma of the liver with extrahepatic obstruction the plasma phosphatase was usually higher than in any other group. It ranged from 20 to 96 units, with an average value of 62 units. In the cases of carcinoma without extrahepatic obstruction the average value was 37 units, with a range from 13 to 80 units.

Plasma Proteins.—Changes in the plasma proteins occurred in each group, and in the cases of hepatitis in which the illness lasted more than two months a close correlation was observed between the fall in the albumin and the extent of the liver damage. Where the latter was greatest, as in the fatal cases of subacute hepatitis, there was also a remarkable rise in the plasma globulin.

The two fatal cases of acute hepatitis had 3.5 and 3.3 g. % albumin. Twenty of the twenty-four cases of acute and subacute hepatitis that recovered had less than 4 g. %. Only four had less than 3 g. %.

The plasma albumin was lowest in the cases of subacute hepatitis that failed to recover. It became still lower as the clinical condition deteriorated, but improved during a remission. Only one of the thirteen cases in this group had more than 2.8 g. % albumin when first seen, and six of the eight fatal cases gave terminal values of less than 2 g. %. Three of the five cases that were still alive had just over 3 g. % albumin when last seen.

Low values were also found in the patients with cirrhosis, but three of the fourteen cases had more than 3.5 g. % albumin when first seen. These three patients were alive and well at the time of the follow-up. Only one patient had less than 2 g. % albumin, and he died within a month. In both types of carcinoma of the liver the plasma albumin was subnormal, and ranged from 3 to 4 g. %.

The fall in the plasma albumin was accompanied by a rise in the plasma globulin in many cases of hepatitis. In one of the fatal cases of acute hepatitis and in thirteen of the acute and subacute cases that recovered the globulin was over 3 g. %. In spite of this, in eleven cases of acute hepatitis and in four cases of subacute hepatitis that recovered the total protein was less than 7 g. %.

In the cases of subacute hepatitis with progressive disease of the liver there was usually a remarkable rise in the plasma globulin, which became still greater as the disease advanced. Only one of the fatal cases had less than 3.7 g. % globulin in the terminal stage of the illness. The increase in the globulin was often responsible for a rise in the total protein, and in seven cases this was over 8 g. %. The highest globulin values recorded were 7.2 and 7.7 g. %, the corresponding total protein being 9.2 and 9.8 g. %.

The rise in the plasma globulin was less striking in cirrhosis than in the fatal cases of subacute hepatitis, but ten patients had over 3.2 g. %. The total protein was less than 6.8 g. % in ten cases and over 8.8 g. % in two cases. The six patients re-examined during the follow-up showed a greater change in the albumin–globulin ratio than was observed when they were first seen.

The globulin was usually not increased in carcinoma. In only one instance was it over 3 g. %, and in other cases it ranged between 1.7 and 2.4 g. The total protein was less than 6.7 g. % in every case except one.

Hippuric Acid Excretion.—In each group the average value for the amount of hippuric acid excretion was subnormal, but there was a wide variation in the individual figures and no close correlation between the amount excreted and the severity or duration of the illness. There was no reliable distinction between the different disease groups. The average two-hourly excretion was slightly lower in the cases of cirrhosis and subacute hepatitis with progressive disease of the liver than in the cases of hepatitis that recovered, and lower in the cases of carcinoma with extrahepatic obstruction than in those without, but there was no difference in the average value for the amount excreted in four hours. Hippuric acid excretion

TABLE I.—*Liver Function Tests in 100 Controls, 71 Cases of Liver Disease, and 62 Cases of Other Diseases*

	No. of Cases	Bilirubin (mg./100 c.cm.)	Phosphatase (units)	Plasma Proteins (g. %)			Hippuric Acid (% excretion)		Laevulose Index
				Total	Albumin	Globulin	2 Hours	4 Hours	
Controls	100	0·5 ± 0·33	8 ± 2·0	7·1 ± 0·38	4·6 ± 0·29	2·2 ± 0·35	59 ± 9·2	88 ± 6·1	11 ± 1·15
Liver diseases	71	8·4 ± 3·46	33 ± 2·52	6·8 ± 0·12	3·2 ± 0·09	3·2 ± 0·13	35 ± 1·7	62 ± 1·7	27 ± 1·60
Other diseases ..	62	0·64 ± 0·08	12·4 ± 1·44	6·7 ± 0·11	4·0 ± 0·08	2·3 ± 0·09	55 ± 1·8	80 ± 1·4	13·8 ± 0·35

In this and the following table the mean values and the standard error of the means are shown for each test. The laevulose index is the sum of the maximum value or blood laevulose plus the value at 2½ hours after ingestion of 100 g. sucrose.

TABLE II.—*Liver Function Tests in 55 Cases of Hepatitis and 16 Cases of Secondary Carcinoma of the Liver*

			No. of Cases	Bilirubin (mg./100 c.cm.)	Phosphatase (units)	Plasma Proteins (g. %)			Hippuric Acid (% Excretion)		Laevulose Index
						Total	Albumin	Globulin	2 Hours	4 Hours	
Acute Hepatitis	Fatal	(a)	2	33·5 ± 4·9	20 ± 9·9	7·0 ± 2·8	3·4 ± 0·14	3·1 ± 1·3	—	—	—
	Recovered	(a)	20	7·0 ± 0·98	24 ± 2·4	6·8 ± 0·14	3·5 ± 0·12	2·9 ± 0·15	43 ± 2·1	68 ± 2·9	19 ± 0·59
		(b)	12	0·5 ± 0·08	10 ± 1·5	7·3 ± 0·25	4·4 ± 0·10	2·6 ± 0·15	54 ± 6·6	83 ± 2·9	14 ± 1·4
Subacute Hepatitis	Recovered	(a)	6	12·2 ± 3·9	24 ± 1·0	7·0 ± 0·3	3·5 ± 0·23	3·1 ± 0·2	37 ± 5·3	63 ± 7·5	27 ± 2·8
		(b)	6	0·75 ± 0·41	12 ± 4·7	7·2 ± 0·2	4·5 ± 0·14	2·7 ± 0·14	57 ± 4·1	85 ± 2·8	14 ± 1·8
	Residual liver disease	(a)	5	12·5 ± 4·8	42 ± 10·0	7·3 ± 0·56	2·8 ± 0·52	4·4 ± 0·49	27 ± 1·3	59 ± 2·2	29 ± 4·4
		(c)	5	2·5 ± 0·57	31 ± 6·2	7·8 ± 0·55	3·2 ± 0·14	4·3 ± 0·59	—	—	—
	Fatal	(a)	8	6·1 ± 2·1	18 ± 3·3	7·3 ± 0·73	2·3 ± 0·18	4·7 ± 0·6	26 ± 2·9	52 ± 5·1	36 ± 4·7
		(d)	7	3·9 ± 1·7	23 ± 4·2	7·8 ± 0·55	1·6 ± 0·12	6·0 ± 0·48	29 ± 4·2	58 ± 8·6	43 ± 3·7
Cirrhosis		(a)	14	1·3 ± 0·28	36 ± 1·7	6·7 ± 0·27	3·1 ± 0·18	3·3 ± 0·21	32 ± 4·6	66 ± 4·9	35 ± 3·2
		(e)	6	1·9 ± 0·52	43 ± 8·3	6·8 ± 0·56	3·0 ± 0·31	3·5 ± 0·6	32 ± 7·0.	69 ± 9·1	38 ± 8·5
Carcinoma with extrahepatic obstruction			9	20·1 ± 2·9	62 ± 8·0	6·4 ± 0·04	3·4 ± 0·03	2·3 ± 0·03	29 ± 2·6	64 ± 3·8	24 ± 6·5
" without " "			7	1·9 ± 0·4	37 ± 7·4	6·1 ± 0·32	3·5 ± 0·12	2·3 ± 0·2	38 ± 1·9	63 ± 9·0	24 ± 3·2

(a) When first seen. (b) After recovery. (c) 3 to 8 months later. (d) Within 1 month of death. (e) 9 months to 2 years later.

and laevulose tolerance were not estimated in the two fatal cases of acute hepatitis.

Laevulose Index.—The average level of the blood laevulose during the two and a half hours after taking 100 g. of sucrose was above normal in each group. It was lower in the cases of acute and subacute hepatitis that recovered than in the cases of cirrhosis and subacute hepatitis with progressive disease. There was less individual variation within the groups and a closer correlation with the general clinical condition than was observed in the hippuric acid test. In carcinoma there was no difference between the obstructive and non-obstructive cases, but there was a wider individual variation than in the other groups. In most cases of carcinoma the level was comparable to that found in mild cases of acute hepatitis.

3. Other Diseases

The results from this series cannot be discussed in detail, and it is only possible to give the average value for the whole group, in Table I. With the few exceptions mentioned below there were no individual cases which showed a deviation from the normal in more than one test, and this was also true for the average values for each group of diseases. The following abnormalities were recorded:

(i) The average value for the plasma bilirubin in eight cases of haemolytic anaemia was 2 mg. per 100 c.cm. In three of these and in eight other anaemias the total protein was below 7 g. %. This was due to a slight fall in the plasma albumin. In no case was there any rise in the globulin.

(ii) A slight rise in the plasma phosphatase was not infrequent. Values over 20 units were found in three of the reticuloses, one case of pernicious anaemia, and one case of thyrotoxicosis.

(iii) The hippuric acid excretion was reduced in both cases of nephritis, and in one case each of myelomatosis, carcinoma, and thyrotoxicosis.

(iv) The laevulose index was below 18 in all but two instances. One was the case of pernicious anaemia mentioned above, and the other was one of the reticuloses in which the liver was involved. It was normal in all the cases of diabetes.

(v) There was a slight fall in the albumin and a rise in the globulin in both cases of myelomatosis and of hypertension, in two of the cases of syphilis, and in one case each of peptic ulcer and diabetes. In addition to the cases of anaemia, the plasma albumin was less than 4 g. % in four cases of thyrotoxicosis, three cases of peptic ulcer, and in all the cases of carcinoma and nephritis. There was no rise in the plasma globulin in these cases.

Discussion

The clinical value of biochemical tests is twofold. They may be important in both diagnosis and prognosis because they often give more accurate information about the functional capacity of an organ than can be obtained by clinical methods alone. In the past the need for diagnostic tests in disease of the liver has been overstressed and relatively little attention has been paid to their prognostic importance. In every case of hepatitis one has to ask oneself, "What is the immediate risk to life? Has the liver suffered irreparable damage? If so, what reserve function still exists?" The present analysis of 55 cases suggests that biochemical tests may help to answer some of these questions, and that when used in this way they are of great value to the clinician.

In so far as all the tests gave average values in disease of the liver which differed significantly from normal, and there were only occasional abnormalities in the other diseases, they appear to be acceptable as liver function tests. Closer analysis, however, shows that in hepatitis they are not all equally useful in the different stages of the disease. The plasma bilirubin is a reliable guide to the immediate prognosis in acute hepatitis, but it is of little value in the subacute and chronic forms. The plasma phosphatase and the hippuric acid test often give valuable supporting evidence of liver damage, but they are not reliable enough to be used as individual tests for the purpose of either diagnosis or prognosis. The laevulose index may be unobtainable in acute hepatitis, and it adds nothing to clinical knowledge at this stage. On the other hand, in subacute and chronic hepatitis it is a good index of the degree of liver damage. It is, however, an inconvenient test in clinical practice, as it involves repeated venepuncture.

Disturbances of the plasma proteins are relatively slight in acute hepatitis, but they are the outstanding feature in the subacute and chronic cases. Normal values are fairly rapidly restored if the case recovers completely, but a persistent alteration of the albumin–globulin ratio indicates that the liver has suffered irreparable damage. In chronic hepatitis adequate liver function may be maintained if there is more than 3.5 g. % albumin, but below this the margin of reserve is poor. A fall below 2 g. % albumin is of grave significance. Of the eight cases in which this figure was recorded only three survived more than three months, and they had permanent liver damage. In subacute hepatitis with progressive disease of the liver an improvement in the plasma albumin coincides with the clinical remissions. A rise in the plasma globulin is common in all varieties of hepatitis. It was invariably present when there was less than 2 g. % albumin. With two exceptions the globulin ultimately reached extremely high values in the fatal cases of subacute hepatitis. Table III shows the close correlation that exists between the changes in the plasma proteins, the prognosis, and the length of time that the jaundice persists.

TABLE III.—*Analysis of 41 Cases of Hepatitis with Jaundice, showing the Correlation between the Duration of the Jaundice, the Prognosis, and the Changes in the Plasma Proteins*

	Duration of Jaundice	
	Less than Two Months	Over Two Months
Number of cases	22	19
Died	2	8
Residual liver damage ..	0	5
Clinical recovery	20	6
Less than 3 g. % albumin ..	3	13
More than 4 g. % globulin	0	10

In the present investigation we have found that a combination of data from the same individual yields more diagnostic information than can be obtained from any single test. The level of the plasma phosphatase is proportional to the level of the bilirubin in jaundice due to biliary obstruction, whereas jaundice that is due solely to haemolysis does not show abnormalities of plasma phosphatase, laevulose tolerance, or hippuric acid excretion. Non-jaundiced cases of cirrhosis that present with ascites or unusual nutritional disturbances are recognized by the disturbance in the plasma proteins and the faulty laevulose tolerance, whereas patients with myelomatosis who have an abnormal albumin–globulin ratio have none of the other changes in the blood chemistry that are found in liver diseases.

The differential diagnosis of subacute hepatitis from obstructive jaundice or carcinoma is often a difficult clinical problem, and laparotomy may be very dangerous. The biochemical data in these cases usually fall into patterns which are easily distinguishable. In subacute hepatitis a moderate rise in bilirubin and phosphatase is accompanied by striking changes in the plasma proteins and a gross reduction in laevulose tolerance. In carcinoma with extrahepatic obstruction the jaundice is associated with a rise in phosphatase; there is usually no change in the plasma globulin, and the laevulose tolerance is not greatly impaired. The changes in carcinoma of the liver without extrahepatic obstruction are the same, except that jaundice is not intense; the phosphatase is still notably raised.

A long and intensive search for specific diagnostic tests in disease of the liver has met with little or no success and has obscured the importance of the changes which occur in the general blood chemistry. Although tests of laevulose tolerance and hippuric acid excretion show abnormal results in disease of the liver, and may be useful when studying the effect on the liver of a potentially toxic substance such as an anaesthetic (Higgins, Macintosh, and O'Brien, 1942), it is doubtful whether in ordinary clinical practice they add much to what can be learnt from a careful study of the blood chemistry. The assessment of liver function is a more practical proposition if it can be performed on a single blood specimen, and it is useful to know that a reasonable estimate can be obtained in this way.

Summary

The subjects studied in this investigation were 100 healthy students and laboratory workers, 71 patients with disease of the liver, and 62 patients suffering from other diseases. Every care was taken to establish the clinical diagnosis beyond doubt.

The laboratory tests in all cases included estimations of the bilirubin, phosphatase, albumin, and globulin in the plasma, and measurement of the hippuric acid excretion and laevulose tolerance.

Analysis of the results indicates that a combination of data of this type has considerable diagnostic and prognostic value.

Changes in the plasma proteins in disease of the liver are of great significance. In cases of hepatitis with jaundice there is a close correlation between the time the jaundice has been present, the changes in the albumin-globulin ratio, and the prognosis. Irreparable liver damage has probably occurred if jaundice persists for more than two months or the plasma albumin falls below 2 g. %. In such cases the plasma globulin is usually over 4 g. %.

Estimation of the amount of bilirubin, phosphatase, albumin, and globulin in the plasma from a single blood specimen usually provides as much diagnostic and prognostic information as can be obtained from more elaborate tests of liver function.

Full case reports with protocols of the biochemical tests can be obtained from the authors.

We are indebted to the honorary staff of the Radcliffe Infirmary for permission to study their cases, and to Dr. A. H. T. Robb-Smith for doing the necropsies. All the laparoscopies were performed by Dr. A. M. Cooke. Miss M. Stanier, Mr. L. A. Rawlings, and Mr. E. R. Flack helped with the biochemical estimations.

REFERENCES

Higgins, G., Macintosh, R. R., and O'Brien, J. R. P. (1942). Communication to Physiol. Soc., July, unpublished.
—— and O'Brien, J. R. P. (1944). In the press.
—— —— and Stewart, A. (1942). Communication to Physiol. Soc., July, unpublished.
Howe, P. E. (1921). *J. biol. Chem.*, **49**, 109.
King, E. J., and Armstrong, A. R. (1934). *Canad. med. Ass. J.*, **31**, 376.
O'Brien, J. R. P. (1944). In the press.
Probstein, J. G., and Londe, S. (1940). *Ann. Surg.*, **111**, 230.
Thannhauser, S. J., and Andersen, E. (1921). *Dtsch. Arch. klin. Med.*, **137**, 179.

SOME USES FOR DRY COLD THERAPY, AND A PROPOSED COOLING CABINET

BY

W. G. BIGELOW
Capt., R.C.A.M.C.
(A Canadian Casualty Clearing Station)

AND

E. C. G. LANYON
Capt., R.E.
(Army Blood Transfusion Service)

The therapeutic use of cold has lately been attracting the attention of investigators in many different fields. Recent studies point to the possibility of its much wider employment as a form of treatment in the future. In amputations for diabetic gangrene Allen (1941) and Bancroft *et al.* (1942) have shown the value of refrigeration as an anaesthetic and demonstrated how it appears to eliminate surgical shock from such a procedure. Its use in retarding the growth and relieving the symptoms of certain malignant tumours was investigated a few years ago by Temple Fay. Several other uses for dry cooling and actual freezing are being studied at the present time.

More important to military surgeons, however, is the steady accumulation of evidence for the value of cold treatment or controlled thawing of lesions of the extremities due to frost-bite and immersion in cold water (Webster *et al.*, 1942; Greene, 1941, 1942; Ungley, 1943). No attempt will be made to summarize that evidence here. Our purpose is to propose a cooling cabinet for the treatment of such lesions and to encourage the investigation of this form of treatment in three other types of cases: (1) wounds of the extremities which have impaired the blood supply sufficiently to endanger the limb; (2) traumatic arterial spasm; (3) peripheral embolism. The refrigerating unit is specially designed for treating such lesions of the extremities in the field. It is a relatively simple mobile self-contained unit, not dependent on any cooling material that may be difficult to obtain. Observations made on a working model already constructed show that the temperature in the limb cabinet is easily controlled and can be maintained at any desired level.

Frost-bite and Immersion Foot

Greene (1941), by enumerating high casualty rates in previous military campaigns, has pointed out the serious potential danger of frost-bite in troops operating in cold weather. To quote one instance, he refers to the week ending Dec. 16, 1916, in which 3,104 frost-bitten men were admitted to medical units in the British Army alone. Adequate prophylaxis will prevent most cases of frost-bite, but tactical situations will not always allow the adoption of proper preventive measures, particularly in sudden changes of weather.

The rationale for the cold treatment of frost-bite and that for immersion foot are basically the same. Each is an attempt to reduce cell metabolism until such time as oxygen can be made available to the cell by the blood in sufficient quantity to satisfy the cell requirements at body temperature. In this way an oxygen deficit which would ordinarily cause death of the cell and gangrene of all or part of the extremity is avoided during the time taken for return to normal circulation and cell nutrition in the affected limb.

Webster first used and demonstrated clinically the value of local refrigeration of limbs in immersion foot. Under this treatment pain was relieved, the oedema subsided, blisters disappeared, and impending gangrene was arrested. During the period of exposure there is a vasoconstrictive ischaemia. On removing the limb from cold water and allowing it to thaw he describes a rapid increase in swelling, with pain. This is considered essentially a vascular response to tissue injury in which a liberated H-substance (Lewis, 1941) produces increased permeability of small vessels with resultant transudation into the tissues. Associated with this swelling there is an intense hyperaemia with anaesthesia and anhidrosis lasting several weeks, which, together with a sensitivity to adrenaline in the affected limbs, is evidence of a sympathetic-nerve or vasomotor paralysis (Ungley and Blackwood, 1942; Webster *et al.*, 1942). After the eighth to tenth day paraesthesias develop with later attacks of hyperhidrosis and cold-sensitiveness suggesting a Raynaud's phenomenon (Ungley).

Webster observes that "at the present it is not known how much of the fluid loss from vessels is due to actual damage of the vascular wall and how much is due to loss of neurogenic control of the vessels." The oxygen deficit in these cases he believes is caused by the intense tissue oedema hindering the transfer of oxygen to the cells plus the increased metabolic demand due to the reaction to tissue injury.

Frost-bite, a more serious problem in mobile war, is a condition in which actual freezing of tissues has occurred comparatively rapidly. Here one finds essentially the same pathogenesis, with a few possible differences depending for the most part on the rate of freezing. The swelling is usually not so pronounced. The period of reactive hyperaemia with increased swelling and pain following removal from cold has been personally observed in a few cases to last only a matter of minutes or hours (as compared with several weeks in immersion foot), depending on the severity of the lesions. This is possibly due to a lesser degree of tissue and nerve damage from a shorter period of exposure to thermal injury. Following this transient hyperaemia one sees the early onset of paraesthesia extending up the limb with varying degrees of sweating. A condition of "stasis" or capillary blockage by cells has been observed experimentally by Kreyburg and Rotnes (1932), confirmed by Greene, using a rapid-freezing technique which further increases the anoxia or oxygen deficit in the tissues. (Review of evidence: Bigelow, 1942.)

Thus, as in immersion foot, refrigeration by dry cooling will lower the metabolic demands of the part until normal neurovascular conditions have been re-established.

Webster in treating immersion foot has already used (1) cold air from a fan, (2) ice packs, (3) a cabinet for the feet in which the cooling device is air blown over ice by a fan. Greene (1942) for the treatment of frost-bite has recently devised a cabinet which is cooled by solid carbon dioxide

placed in an upper compartment with connecting flues. Ungley (1943) has lately constructed and used a similar refrigerator.

If the rationale of this treatment be accepted, frost-bite casualties on arrival at a C.C.S. or base medical unit should have the affected limbs inserted in a cooling cabinet, where they would remain until the circulation had been re-established and the greater part of the oedema had disappeared. During this period the temperature of the cabinet could be gradually increased daily until it reached room temperature. The length of time required for this "controlled thawing" would be several days, depending on the severity of the lesion.

Extremity Wounds, with Impaired Blood Supply

In an extremity in which the wound or injury has impaired the blood supply sufficiently to produce a danger of ischaemic gangrene one has a fundamentally similar problem. The ischaemia which is responsible for the oxygen deficit in the tissues may be due to ligation of main arteries, destruction of collateral branches, or intense swelling and oedema exerting pressure in fascial compartments and hindering the normal transfer of oxygen to the tissues.

To refrigerate the distal extremity of limbs with dangerously impaired blood supply, from whatever cause, appears perfectly reasonable. By so doing one lowers the metabolic requirements of the endangered tissues until such time as the collateral circulation has been established and swelling has subsided. It has been proved experimentally (Brooks and Duncan, 1940; Allen, 1941) that the ischaemic limb or tail of an animal survives a great deal longer when treated by dry cold than when left at room temperature. Allen also observes that the cold apparently inhibits blood-clotting and thrombosis, and he has demonstrated clinically that it prevents the coagulation of exudate in wound margins, thus facilitating drainage while retarding healing. Further benefits from cold therapy would be the relief from pain and the inhibition of any infective process that may be present in the affected part until such time as an improved blood supply might deal with it more effectively.

It may be argued that cold applied to the limb will induce a degree of arterial spasm and thus hinder the development of a collateral circulation. Very low temperatures, however, need not be used, and any tendency to vasospasm could be offset by coincident anaesthesia of the sympathetic nerve supply, heat applied to the other limbs, or vasodilator drugs. It is also possible that some phase of the biochemical process of tissue oxidation may be inhibited by too low a temperature, and in such an instance cold therapy could conceivably be harmful. If this is the case some form of temperature regulation is necessary.

The above experimental and clinical observations, based on apparently sound theory, should warrant investigation into the treatment of limb extremities, in certain types of wounds, by dry cooling and a gradual return to room temperature.

Traumatic Arterial Spasm

Increasing attention has been paid by surgeons recently to the occurrence of an arterial spasm associated with some wounds and fractures of the extremities (Cohen, 1940; Griffiths, 1940; Barnes and Trueta, 1942; MacFarlane, 1942). In such cases there is a history of trauma to the artery, which on exposure may or may not reveal any obvious evidence of damage. The resultant spasm has been shown experimentally (Barnes and Trueta, 1942) and clinically by these investigators to involve in most cases the entire vascular tree of the limb, and leads sometimes to gangrene. Griffiths has recently concluded that Volkmann's ischaemic contracture "is due to arterial injury and to the accompanying spasm of the arterial circulation." The pathology of the muscle necrosis in this condition and so-called traumatic arterial spasm has been observed to be similar (MacFarlane, 1942).

Cold therapy has already been considered and used by Canadian Army surgeons for traumatic arterial spasm. Again it must be remembered that cold in itself produces certain degrees of arterial spasm, and only further investigation will prove that in the balance greater benefit is conferred by its ability to lower the metabolic requirements of the tissues. Acting on this latter assumption, however, these limbs can be refrigerated as an adjunct to the specific forms of therapy already recommended, such as surgical exposure of the artery, sympathectomy, arteriectomy, and the use of vasodilators. Since it has been observed that this spasm sometimes disappears spontaneously after a few days with the return of arterial pulse, cold therapy could be used as part of the conservation therapy routine provided no undue compression of the artery is considered likely to exist.

Peripheral Embolism

Acting on the same principle, and already suggested by Allen, dry cooling of a limb in which there has been an embolic blockage of its blood supply would enable the tissues to carry on at a reduced metabolic rate until the establishment of an improved circulation. Whether in conjunction with embolectomy or other lines of conservative treatment, tissue vitality would theoretically be retained during the time required for relief of the associated vasospasm or the development of a collateral circulation.

Description of Unit

The unit (Figs. 1–3) has been designed to accommodate two limbs if necessary. The cabinet or limb unit is cooled by cold brine, which circulates through coils in the wall, the

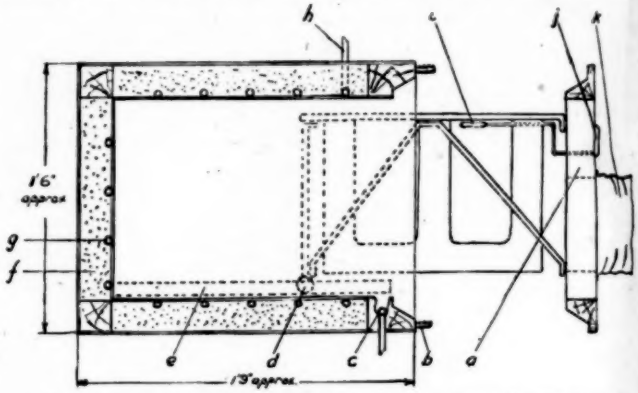

FIG. 1.—Side view of limb cabinet. *a*, Front panel with frame and slings attached. *b*, Studs for securing front panel. *c*, Trough with drain for condensate. *d*, Castors on front of frame. *e*, Guide for castors. *f*, Cork insulation. *g*, Brine pipes soldered to inner walls. *h*, Brine return pipe. *i*, Thermometer bulb. *j*, Thermometer dial. *k*, Canvas sleeve. *l*, Holes in front panel for entry of limbs. *m*, Brine-flow regulating valve. *n*, Hose union for brine pipe from reservoir.

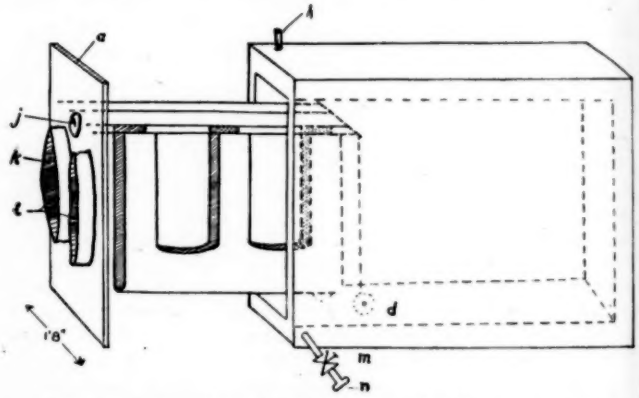

FIG. 2.—Perspective of limb cabinet, showing one canvas sling. (For explanation of lettering see Fig. 1.)

temperature of the cabinet being regulated by merely adjusting the rate of flow of cold brine, using a stopcock and thermometer, conveniently placed for the patient to do his own adjusting.* The slings for the limbs are suspended from

* This method was used satisfactorily on the experimental model, but it has since been determined that it would be possible to have an automatic valve made which would pass just the requisite amount of brine to maintain the cabinet at any predetermined temperature. The whole equipment would thus be independent of any manual control.

a metal framework which is integral with the front panel. Thus by detaching the front panel the limbs can be withdrawn for observation or dressings with a minimum of trauma and without disturbing their position in the slings. This operation is facilitated by the provision of castors on the far end of the frame running in guides on the floor of the cabinet.

The brine circulating in the limb cabinet is cooled in a reservoir to a predetermined temperature by a separate refrigerating machine and pumped to the limb cabinet through a flexible tube. Several limb cabinets can be attached to the brine supply at one time, thus allowing treatment of more than one patient, and by adjusting the stopcocks (previously described) on the limb cabinets it is possible, if necessary, to maintain different temperatures in each of the cabinets.

The actual refrigerating machine with brine reservoir would be a mobile unit mounted on a trolley and operated entirely by electricity. Its essential components would be a small compressor operated by an electric motor, an air-cooled condenser, and an automatic expansion valve for regulating the flow of refrigerant. The brine reservoir would be mounted alongside the machine, and would consist of an insulated tank with a suitable coil of cooling pipe immersed in the brine. This coil would be cooled by admission of liquid refrigerant through the expansion valve; the refrigerant when vaporized would be pumped out by the compressor and recondensed in the air-cooled condenser. The brine could be kept within 2° C. of any desired temperature by means of a thermostat, which would automatically start and stop the electric motor driving the compressor. The cooled brine would be taken from the reservoir by a small electrically driven centrifugal pump, and circulated to the various units by way of a manifold and flexible hoses, returning afterwards to the reservoir for re-cooling. It is estimated that the dimensions of a complete refrigerating unit as described, and capable of operating up to four limb cabinets, would not exceed 2 ft. 6 in. by 2 ft. 6 in. by 2 ft. 3 in.

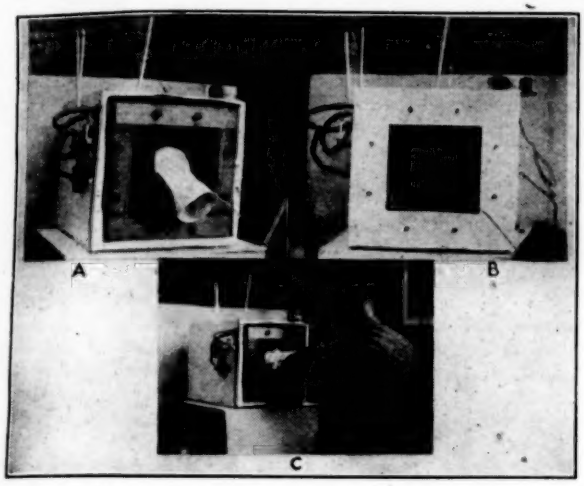

FIG. 3.—The experimental cabinet. A, View of cabinet with front in position. B, Front removed, showing rest for hand. C, Patient's forearm in position. (The thermometers shown were used in making experimental observations.)

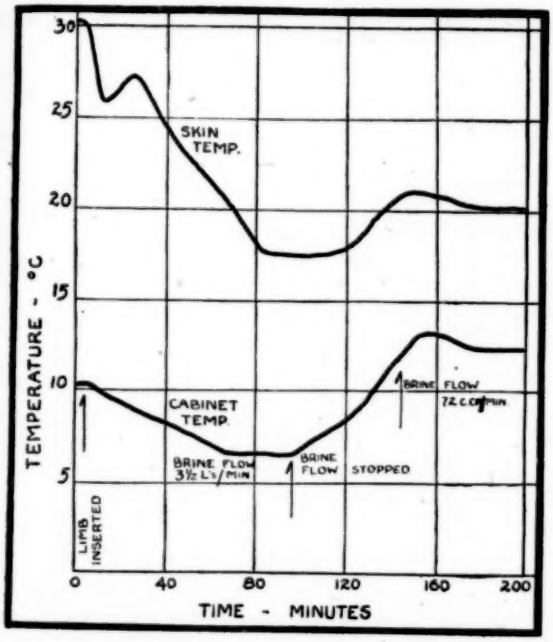

FIG. 4.—Graph showing record of cabinet and skin temperatures (June, 1943).

The cabinet described can be operated over a very wide range of temperature. It has been determined experimentally that in order to maintain a cabinet temperature of 4° C. to 6° C. the brine circulating need only be 0° C. to −2° C. Therefore, by lowering the temperature of the brine reservoir, which is done by adjustment of a thermostat, temperatures well below freezing-point could be maintained in the cabinet.

The working model constructed by one of us (Lanyon) for investigation has a small limb cabinet capable of accommodating a hand and lower forearm (see photographs, Fig. 3). Observations made on an empty cabinet and again with a normal limb inserted proved the ability of the cabinet to assume any given temperature and to maintain this temperature with the minimum of adjustment. Dermatherm readings, to record the resultant changes in skin temperatures, made by attaching a thermocouple to the dorsum of the hand, showed coincident variation of skin temperatures (see Graph). With such an apparatus, cabinet temperatures from 4° C. to room temperature were obtained. After two hours' exposure at a cabinet temperature around 12° C. the limb appears to be completely chilled, evidence of this being the subjective numbness and the fact that it takes several hours for the skin temperature to return to normal after removal from the cabinet.

Summary

A description is given of a refrigerating device to investigate the dry cold treatment of frost-bite, traumatic arterial spasm, peripheral embolism, and certain wounds of the extremities.

Observations made on a working model have proved it capable of providing the conditions necessary for such treatment.

The apparatus is simple, portable, and flexible in operation, and has been designed primarily to meet the requirements of an army in the field.

We acknowledge with thanks the helpful advice of Lieut.-Col. E. H. Botterell, Basingstoke Neurological and Plastic Surgery Hospital, and the facilities provided by the Officer Commanding Army Blood Supply Depot for carrying out the experimental work.

REFERENCES

Allen, F. M. (1941). *Amer. J. Surg.*, **52**, 225 (see Bibliography).
Bancroft, F. W., Fuller, A. G., and Ruggiero, W. F. (1942). *Ann. Surg.*, **115**, 621.
Barnes, J. M., and Trueta, J. (1942). *Brit. J. Surg.*, **30**, 74.
Bigelow, W. G. (1942). *Canad. med. Ass. J.*, **47**, 529.
Brooks, B., and Duncan, G. W. (1940). *Ann. Surg.*, **112**, 130.
Cohen, S. M. (1940). *Guy's Hosp. Rep.*, **90**, 201.
Greene, R. (1941). *Lancet*, **2**, 689.
—— (1942). Ibid., **2**, 695.
Griffiths, D. L. (1940). *Brit. J. Surg.*, **28**, 239.
Kreyburg, L., and Rotnes, L. (1932). *Acta path. microbiol. scand.*, Supp., **11**, 162.
Lewis, Sir T. (1941). *British Medical Journal*, **2**, 795.
MacFarlane, J. A. (1942). *J. Bone Jt. Surg.*, **24**, 739.
Ungley, C. C. (1943). *Lancet*, **1**, 681.
—— and Blackwood, W. (1942). Ibid., **2**, 447.
Webster, D. R., Woolhouse, F. M., and Johnston, J. L. (1942). *J. Bone Jt. Surg.*, **24**, 785.

A new decree has been issued in Rumania which states that everyone with venereal disease must undergo treatment, and premarital certification of freedom from infection is obligatory. Physicians must report defaulting patients. Persons exposed to risk through their profession—e.g., those serving in hotels, restaurants, night clubs, public baths, as well as pedlars and street vendors—are subject to periodic examinations. Correctional imprisonment of 1 to 3 years is imposed on clandestine prostitutes and proprietors of hotels who allow prostitution on their premises. Knowing transmission of the disease to others carries a sentence of 1 to 5 years' correctional imprisonment and a fine of 50,000 to 200,000 lei. . . . Persons undergoing medical treatment at the time of transmission of the disease will be severely punished without the application of extenuating circumstances. Free blood tests are made by the State. Brothels are again permitted by law.

AETIOLOGY OF "IMMERSION FOOT"

BY

B. W. GOLDSTONE, M.B., B.Sc., F.R.C.S.Ed.
Major, R.A.M.C.

AND

H. V. CORBETT, M.D., M.Sc., M.M.S.A., D.R.C.O.G.
Major, R.A.M.C.

Shipwrecked men adrift on rafts, at times half covered with sea-water, are subject to the lesions of "immersion foot" and "immersion hand." The war has obviously caused a great increase in the number of these cases, yet the clinical descriptions available were scanty until Ungley and Blackwood (1942) published their careful observations. We have now seen four parties of men rescued after many days at sea in a half-soaked state. These cases showed features that surprised us; especially the fact that the lesions had occurred at a time when the temperature never reached freezing-point, and in one instance during the summer. This was contrary to all our preconceived ideas of the lesion, which was previously assumed to be similar to a slow frost-bite. Our purpose in this paper is (i) to confirm the clinical picture as established by Ungley and Blackwood (1942); (ii) to present a conception of its aetiology; (iii) to describe a remarkable complication.

There were four parties of rescued men. The numbers were respectively 9, 1, 1, and 10. Nearly all showed roughly the following syndrome, some having interesting complications which will be described afterwards.

Swollen Stage

This stage was present soon after they were taken from the water. The hands and feet were greatly swollen and the skin was shiny. The extremities showed muscular paresis and there was complete anaesthesia both of hands and of feet; in some cases the anaesthesia extended as high as the middle of the lower leg. Pain was not a marked feature at this stage. There was pyrexia for a few days.

Stage of Diminishing Oedema

After about a week the hands and feet shrank. The skin was no longer shiny, but wrinkled and dull; anaesthesia was passing off, though it was still present at the extreme distal parts—e.g., soles of feet. Paraesthesiae were present; these ranged from mere pins-and-needles to agonizing pains which prevented sleep for many nights. These pains often continued for several weeks with diminishing severity. Frequently there was so much tenderness that the patient could not bear the weight of the sheets upon his toes. Even when the lower leg bore no outward mark of any lesion, there was often agonizing pain on pressure at the lower part of the calf and tendo Achillis, and the ankle-jerks were diminished or absent.

It will be seen that the whole clinical picture bears a pronounced resemblance to a condition of peripheral neuritis. The muscular paresis, the anaesthesia, the agonizing pains, and the frequent absence of reflexes all help to build up this resemblance. Throughout this stage the feet are warm and the pulsation of the dorsalis pedis and posterior tibial arteries is good.

Complications

Gangrene.—In the first party of 9 cases gangrene did not occur. It was seen in the third party. In this one case the man had drifted for 15 days, in summer weather, with his feet partially immersed, and gangrene of the fore part of the feet and of the heels occurred. We saw this case only at a very late stage, by the kindness of Mr. McIndoe. There had certainly been gangrene; according to the patient's own statement, tingling followed by numbness began on the third or fourth day, and thereafter he noticed the gradual onset of blackness of the feet. There was no pain, but he was aware of what was happening. Gangrene probably became certain about the seventh or eighth day. The fourth party—10 men—had been waterlogged for 80 hours in very mild weather. Of these, one man had only slight superficial gangrene of the skin of the knuckles on one hand. This hand had been continually grasping a rope of the raft without letting go. It was quite obvious that the gangrenous patches corresponded to the whitening of the knuckles (and consequent ischaemia) that would result from the continual clutching. We feel that gangrene is not an essential or even a common feature of the typical lesion, and would appear to occur under exceptional conditions which would kill any normal man long before the onset of foot gangrene.

Salt-water Rash.—This occurred in two of the cases. It consisted of minute boils spread over the skin. It appeared only on the chest, and we have not yet seen it in relation to the typical lesion of immersion foot. Its interest lies in the manner in which the toxic action of the salt water on the skin is shown in its fullest form—as apart from the action of cold.

Duodenitis.—We do not know how common this complication is, but as it certainly occurred in one, and possibly two, of our series, we shall describe it. The first patient, about a week after his rescue, began to pass altered blood and then bright blood per rectum. He rapidly became exsanguinated. A diagnosis of possible bleeding duodenal ulcer was made, although no previous history of ulcer could be obtained. His condition gradually became worse, and in spite of transfusions he died. The following is an extract of the necropsy report:

"The stomach contained a little mucoid fluid and had pale walls. The whole of the small intestine and much of the colon were filled with a dark tarry faecal material. There was no tumour or ulcer visible in the wall, but the whole of the duodenum was deeply engorged and oedematous—obviously the origin of the fatal haemorrhage. The liver weighed 70 oz. and had a smooth grey surface. The substance was soft, and showed bile staining around many of the intrahepatic channels. The kidneys weighed 11 oz. Their capsules stripped from a smooth pale surface. On section, differentiation of structure was poor and there was some cloudy swelling. . . . In my opinion the cause of death was: (*a*) small-intestinal haemorrhage; (*b*) acute toxic hepatitis and nephritis; (*c*) chilling of both legs from prolonged immersion."

The second patient, apart from any leading questions, complained of fairly severe epigastric pain 1½ to 2 hours after meals. He had never before had dyspepsia, and the type of his pain is suggestive of duodenitis.

Discussion

Greene (1941) stated: "I gather that clinically it [immersion foot] is almost identical with trench foot." He also stated that "trench foot is almost identical with gradual frost-bite." We wish to draw a clear distinction between the two conditions (frost-bite and immersion foot) for the following reasons:

Lewis and Love (1926) have shown that very probably the essential feature in production of frost-bite is actual freezing of the skin. They demonstrated that if the freezing-point of the skin could be depressed (as by inunction with oil) it would be relatively protected from frost-bite. They showed, in fact, that it would need to fall to −2.2° C. at least for the skin to freeze. In the evolution of our cases the temperature never fell below zero, according to the cases at our disposal. We stress this point because a clear-cut phenomenon like freezing most probably changes the living cell immediately: its metabolism would cease, and its membrane must run the risk of bursting by reason of the sudden formation of ice within it. As Lewis and Love (1926) state, "The hardening and firm union of [ice] crystals, at first separate, is an event especially calculated to produce cellular damage, and it is to cellular damage that the after-effects must be ascribed, for they are in all respects similar to those produced by mechanical injuries delivered from outside—for example, the lash of a whip."

The aetiology of immersion foot is a gradual chilling, never frost. This chilling produces a vicious circle when the familiar protective reflex of local arteriolar spasm is superadded. Thus all tissues soon begin to suffer from a combined insult—cold and relative ischaemia. The weakest tissue would suffer most. It is logical to suppose that the biologically most delicate tissue would show the lesion first. Nerve tissue is probably the most delicate, hence the syndrome of peripheral neuritis is the predominant clinical feature. Support for this view is especially furnished by two of the cases. In both of these the tissue of the lower leg revealed no sign of skin damage, yet both showed signs of peripheral neuritis: one had anaesthesia of the lower calf, and the other great tenderness on deep pressure of the calf and an absent ankle-jerk. Since originally writing this we have read Ungley and Blackwood's (1942) paper. Their microscopical observations on post-mortem material confirm this point—namely, that Wallerian degeneration was the outstanding lesion.

It is obvious that if the chilling process is sufficiently prolonged the metabolic handicap would become intolerable to each tissue in turn. Thus each tissue, in the order of its strength, would successively fail in its function, then die. Finally, the lowest and most tolerant of all tissue (connective tissue and tendon) would fail to survive the more organized tissues. The whole part would then be gangrenous, as in the case of one of our patients who was 15 days on a waterlogged dinghy. Probably few men could survive this long test, and gangrene is therefore a rare occurrence in the disease of

immersion foot. Is cold, then, directly the major factor in the metabolic handicap, or is the relative ischaemia—an indirect result of the cold—principally responsible for the lesion? Both views are considered by Ungley and Blackwood (1942), who fully discuss the two theories. It seems more probable that ischaemia is the responsible agent.

The aetiology of frost-bite is quite different. In its purest and most dramatic form it occurs suddenly, as in the case of Greene's (1940) experience with a camera shutter. He states: "The contact of a momentarily ungloved finger with the button of a camera in a high wind at a temperature below zero Fahrenheit and at a height of about 25,000 ft. once cost me a finger-tip." Here we have a sudden mechanical accident. It produces the familiar appearance (like a localized infarct) of frost-bite. Within this area all tissues, irrespective of their biological resistance, are dead. In the mechanical explosion the strong have perished with the weak.

Of course there must be mentioned forms in which frost-bite becomes superadded to immersion foot. We have never seen trench foot, but in this there would be an opportunity for a combination of the two syndromes: a succession of rain, mud, and slush would give the prolonged chilling sufficient for the development of immersion foot; and, as Lewis and Love (1926) have shown, by the washing away of skin oils would, with the advent of frost, predispose the tissues to the development of frost-bite if the temperature suddenly fell below freezing-point.

Other Complications

Salt-water Boils.—It might be objected that the syndrome we describe could have been caused by either the chemical or the osmotic action of the sea-water and not by the chilling effect. However, the location of salt-water boils on the chest in two of our cases should answer this objection. The chest, by reason of its rich blood supply and high mass-surface ratio, is not liable to cooling, and would therefore show a pure result of toxic action as apart from chilling. With regard to osmotic action, sea-water is about 2½ times as strong osmotically as human tissues. No osmotic action could have occurred through the skin, otherwise the tissues would have shrunk and not swollen.

Duodenitis.—Nearly all our patients had pyrexia in the early stages; they were not infected. This must have been non-specific traumatic fever, caused by the absorption of toxins from traumatized areas. Curling's ulcer of the duodenum occurs as a result of absorption of toxins from burnt areas. The similar aetiology of Curling's ulcer and our case of duodenitis is certainly striking, but it would be beyond the scope of this paper to speculate on the mechanism of this duodenitis.

Treatment

From time immemorial the danger of rapidly warming frost-bitten areas has been recognized. Greene (1942) has given a scientific basis to this idea by freezing a rat's tail and then thawing it in front of a fire. This caused the loss of nearly twice the tissue that would otherwise have occurred. Smith, Ritchie, and Dawson (quoted by Greene, 1940) suggest that it may be due to rupture of capillaries previously damaged by frost. Lewis and Love (1926) suggest that the presence of histamine-like substances causes an excessive and dangerous transudation.

It might be thought that these considerations were not specially applicable to cases of immersion foot. But Ungley and Blackwood (1942) sound a word of warning against the use of heat. They quote the experiment of Allen on chilled ischaemic rats' tails. These survived much longer than the unchilled controls. He suggests, therefore, that in a recent case of immersion foot it is dangerous to warm the part before circulation has returned: warmth raises its metabolism to a point beyond the capacity of the feeble circulation to supply it. Thus the tissues are rapidly brought to a state of metabolic bankruptcy, and necrosis occurs.

It should be noted that the theoretical objections to warmth in the treatment of frost-bite are based on the vasodilator effect of heat.

We refer again to Lewis and Love's experiment in which vesicle formation on warming a frost-bitten part was minimized by compressing the main limb artery. Smith, Ritchie, and Dawson (quoted by Ungley and Blackwood, 1942) stated that actual rupture of frost-bitten capillaries occurred with too forceful vasodilatation. The objection to heat in cases of immersion foot, however, is somewhat different. The rise of temperature is considered undesirable because it raises the metabolic rate of the tissues out of proportion to their diminished blood supply. Therefore an increased vasodilatation, undesirable though it may be in frost-bite, is appropriate here. In this way the blood supply is adequately increased to keep pace with the enhanced metabolism.

There would here seem to be a field for the cautious simultaneous use of two separate elements in treatment: (1) local application of cool air to the damaged feet; (2) measures for active local vasodilatation. A mild type of local vasodilatation could be obtained by warmth applied to the whole body while the damaged feet were simultaneously kept cool to maintain their low metabolism. The French school have practised more intense measures for obtaining vasodilatation in the affected feet: the lumbar sympathetic chain is injected with a local anaesthetic. Stricker and Buck (1940) give a detailed report of two cases in which this treatment was carried out. They claim an immediate and remarkable improvement in the damaged limb; it becomes warmer, less dusky, and much less painful. Unfortunately, in their cases they make no clear distinction between trench or immersion foot and frost-bite. It should be noted that they started their treatment one day after rescue. English opinion is at present against measures for active vasodilatation; and, indeed, the average mild case will get better with the general treatment advocated. But with really severe cases it may be worth while cautiously to try the combination suggested by these theoretical considerations. We have not yet had the opportunity. After the first few days of illness most of our patients were allowed a heat-cradle to their feet. When the pain became severe they begged for the cradle; it relieved the pain.

In cases of older people with a weakened detoxicating action of the liver it would certainly seem worth while to prevent erosion of the duodenum by placing them on a peptic ulcer regime for about a week. The paretic condition of the feet should also receive consideration: with weakened neuro-muscular apparatus in the foot, there is also the danger of acute flat-foot. Patients should not be allowed to bear weight too early, and severe cases should receive faradization and special exercises to the foot muscles as a preliminary to walking.

Summary

The syndrome of immersion foot is described. Commonly it bears a striking resemblance to peripheral neuritis.

It appears that the disease may be regarded as a massive chilling and ischaemia of all the various tissues in the foot or hand. These are successively affected in the inverse order of their biological fortitude. Thus the clinical picture may vary from a mere peripheral neuritis to the rare stage of gangrene. Most patients are rescued in the stage of skin and nerve damage. They would probably rarely survive to reach the stage of gangrene, but one case of gangrene is described.

The syndrome is in sharp contrast to that of frost-bite, in which by reason of a mechanical accident (ice-crystal formation) all tissues involved in the area suffer simultaneous death irrespective of their relative hardihood.

Treatment of the two diseases is not the same: measures for active vasodilatation are under certain circumstances indicated in immersion foot, but are dangerous in frost-bite. However, both types of lesion should be kept cool in their early stages.

Mixed forms of the two diseases are postulated.

The complication of duodenitis with duodenal haemorrhage is described. It is suggested that this may be due to the absorption of toxins from the damaged area. The similarity with Curling's duodenal ulcer in burnt patients is noted.

We wish to acknowledge the help and kindly criticism of Mr. A. H. McIndoe. Our thanks are also due to Dr. E. T. Ruston, who carried out the post-mortem examination, and to the coroner for East Surrey for his kind permission to publish extracts of the necropsy report.

References

Greene, R. (1940). *Lancet*, **1**, 303.
—— (1941). Ibid., **1**, 689.
—— (1942). Ibid., **2**, 695.
Lewis, T., and Love, W. S. (1926). *Heart*, **13**, 27.
Stricker, T., and Buck, F. (1940). *Mém. Acad. Chir.*, **66**, 235.
Ungley, C. C., and Blackwood, W. (1942). *Lancet*, **2**, 447.

RESULTS OF EXTERNAL PROPHYLACTIC VERSION

BY

M. V. TRUBKOWITCH, M.D.

Second Obstetric-Gynaecological Clinic of the Second Moscow Medical Institute

AND

Prof. B. A. ARCHANGELSKY, M.D.

Director of the Clinic

This is a preliminary communication with the object of setting out results of prophylactic cephalic version conducted under the direction of Prof. Archangelsky in cases of breech and transverse presentations. It relates to the period 1931–41, with the majority of cases dealt with in the years 1940–1.

External version was carried out in 324 cases of breech, transverse, and oblique presentations. Of these 324 cases version was successfully performed in 293 (90.5%) and unsuccessfully in 31 (9.5%). Of the 293 successful cases 251 had been breech and 42 transverse and oblique. In somewhat under 10% of the cases either version could not be performed or, when performed, the position of the foetus relapsed into the original state. As a rule the operation was conducted in the 35th to 36th week of pregnancy, and only in 4 instances was an anaesthetic employed. In the majority of cases of successful version the desired result was obtained at the first attempt. Repeated attempts had to be made in a few isolated cases—multiparae with a small foetus and lax pendulous abdomen.

To what extent is foetal mortality reduced by the timely performance of version? Of 247 births that took place after version 3 were stillbirths (1.2%). On the other hand, among 19 cases in which version was not successful there were 2 stillbirths (10.5%). Of 228 cases in which the performance of version procured a vertex presentation there was only one stillbirth (0.44%).

Table to Illustrate the Foregoing

	No. of Births	Live Births	Stillborn
Version performed ..	247	244 (98·8%)	3 (1·2 %)
„ successful ..	228	227 (99·6%)	1 (0·44%)
„ unsuccessful ..	19	17 (89·5%)	2 (10·5 %)

What is the Significance of External Prophylactic Version in Obstetrics?

To answer this we must examine the incidence of the various abnormal positions of the foetus. Of 107,966 births in the city of Moscow 99,552 took place at term. Of these 99,552 full-term births 96,048 (96.2%) were vertex presentations, 3,148 were breech (3.2%), and 356 cases were transverse and oblique (0.4%). Thus all non-vertex presentations provided 3.6%. Of the 96,048 head-presentation births 905 (0.94%), of the 3,148 breech presentations 318 (10.1%), and of the 356 transverse presentations 104 (29.2%) were stillborn.

	Births	Stillborn
Total number of births	107,966	2,048 (1·88%)
Full-term births	99,552	1,327 (1·32%)
Head presentation	96,048	905 (0·94%)
Breech „	3,148	318 (10·1%)
Transverse and oblique	356	104 (29·2%)
After version	247	3 (1·2%)
After successful version	228	1 (0·44%)

It will thus be seen that successful version reduces the mortality to the level obtained in ordinary head presentation and so reduces the foetal mortality in breech presentation 10 times and in transverse or oblique presentations 25 times.

Complications Attendant on Version

1. *Premature Labour.*—Out of 103,735 births in Moscow 7,687 (7.4%) were premature. Out of 228 cases in which version procured a head presentation at birth 2 were premature, or below 1%. This low rate is explained partly by the fact that version was done in the 36th week, a time close to full term already, and partly by the fact that version was not performed when there were any contraindications. Obviously premature labour, where it took place, occurred before the date at which version would normally have been undertaken. All the same, the fact that only 1% of premature labour took place after version in 228 cases permits of the conclusion that version *per se* does not lead to premature labour.

2. *Haemorrhage.*—Out of 324 cases in which version was carried out only 1 case had slight haemorrhage—about 3 weeks before the onset of labour—and this had no effect on the subsequent period of pregnancy or labour.

3. *Premature Separation of the Placenta; Adherent Placenta Requiring Manual Separation.*—These conditions did not occur in any of our cases. This leads to the conclusion that external version, when all contraindications are carefully observed, does not lead to risks of haemorrhage.

4. *Premature Loss of Liquor Amnii.*—Out of all our cases this took place in about 5%. In the cases in which version was carried out premature rupture of the membranes occurred in 2%. This leads to the conclusion that the treatment exerts no influence in this direction.

5. *Prolapse of the Cord.*—Among all our clinical material this was observed in 0.4% of cases of head presentation and 2.1% of cases of breech presentation. After version which secured a head presentation this took place in 0.44%. The conclusion is reached that prolapse of the cord is not accelerated by version. On the other hand, in those cases in which a breech presentation could not be successfully turned into a head presentation prolapse of the cord took place in 11.5%.

6. *Does Version produce a More Frequent Occurrence of a Twisted Cord?*—Among all our clinical cases this was observed in 16.8%. Out of 228 cases in which version procured a head presentation at birth this was noted in 12 cases, or 5.2%.

We see, therefore, that external cephalic version does not contain any dangers provided it is carried out with due regard to indications, contraindications, and proper technique.

Medical Memoranda

Histiocytic Medullary Reticulosis with Transient Skin Lesions

In 1939 Bodley Scott and Robb-Smith separated from the group of diseases commonly known as "atypical Hodgkin's disease" a number of cases with such a uniform clinical and pathological picture as to suggest that they represented a distinct disease process. Histologically they showed a cellular proliferation, involving chiefly the histiocytes and their precursors, which affected the whole lympho-reticular tissue, the medullary portions of the organs being principally affected; and for these reasons "histiocytic medullary reticulosis" was suggested as a pathologically descriptive name for the disease. They reported four new cases and gave records of six others which had previously been published. The clinical picture was that of a rapidly fatal disease characterized by fever, wasting, generalized enlargement of the lymph nodes, enlargement of the liver and spleen, progressive anaemia, leucopenia, and, in some cases, purpura and jaundice. The following case, which histologically proved to be typical of this disease, showed many of these clinical features but differed in presenting a leucocytosis, which has not been previously recorded, and skin infiltrations, which had disappeared by the time the patient died.

CASE RECORD

A married woman aged 52 was seen in consultation with Dr. H. S. K. Lowry on Nov. 3, 1942, complaining of weakness. She had enjoyed good health apart from a rash two years previously which was thought to be pemphigus. For three and a half weeks she had been easily tired. Two weeks later she had diarrhoea and a temperature of 101°. Four days after this she developed a cough with rusty sputum. On sulphapyridine the temperature fell to normal and then gradually rose again. Two days before the consultation a tender purplish lump had appeared on the face, and this was followed by similar lesions on the trunk and limbs.

On examination her temperature was 98.6° and pulse 102. She looked ill. Her face had a yellow tinge, but there was no jaundice. The mucous membranes were pale. The skin lesions were situated on the forehead, cheeks, neck, upper chest, back, and proximal halves of arms and legs. They were raised purplish-red plaques

varying in diameter from 1/4 to 1 in., firm in consistency, and tender. The colour faded on pressure but did not completely disappear. There were enlarged soft lymph nodes in the left posterior triangle and right axilla. There was an area of impaired resonance with diminished air entry and rales in the left axilla. The liver was enlarged to 1/2 in. below the costal margin, and the tip of the spleen was just palpable. A blood count gave: erythrocytes, 3,910,000; haemoglobin, 62%; colour index, 0.8%; leucocytes, 13,400 (polymorphonuclears 10,251, lymphocytes 2,680, eosinophils *nil*, basophils *nil*, large mononuclears 469). The Paul-Bunnell test was negative, as was blood culture. The urine was normal.

The patient ran an irregular pyrexia up to 103°. Fresh skin lesions appeared during the next two days and then gradually faded and disappeared. None were visible at the time of her death. Enlarged nodes were palpable in both posterior triangles, axillae, and groins. The spleen became more easily palpable. The leucocyte count rose to 17,800 and then fell to 7,600 shortly before death. In spite of blood transfusion haemoglobin fell to 43%; she developed ascites and oedema, and died on Nov. 30, 7½ weeks after the onset of symptoms. At no time during the illness were there petechiae or haemorrhages from mucous membranes.

Post-mortem Examination (Dr. T. B. H. Haslett).—There was generalized enlargement of lymph nodes, more particularly those of the aortic, coeliac, and mesenteric groups. They were white and fleshy, with considerable haemorrhage into the mesenteric nodes. The spleen was enlarged, soft, and red, the increase appearing to be chiefly in the pulp, although there were a few discrete white nodules on the cut surface. The liver was fatty but otherwise normal. The lungs showed passive congestion and terminal bronchitis. The other organs were normal.

Histological Report (Dr. A. H. T. Robb-Smith).—Section of a lymph node showed a marked proliferation in the sinus and medulla of the histiocytic elements and of atypical cells—pro-histiocytes; i.e., large cells which are polygonal in outline with nuclei rich in chromatin and prominent nucleoli. There were also zones of fibrinoid necrosis, but no obvious increase of fibrous tissue and no free iron could be observed, nor was there any proliferation of the histiocytic elements in the peri-adenoid tissue. The spleen showed a comparable picture, although the degree of necrosis was even more marked, and it had only an occasional follicle which could be made out. There was no free iron in the spleen. Both in the lymph node and in the spleen there had been phagocytosis of the red cells by the histiocytes. The liver was the least involved. There were a few periportal collections of pro-histiocytes, but the Kupffer cells, although hypertrophied, were essentially normal. The appearances throughout all the organs were typical of histiocytic medullary reticulosis.

R. G. ANDERSON, M.D., M.R.C.P.,
Hon. Physician, Cheltenham General Hospital.

REFERENCE

Scott, R. Bodley, and Robb-Smith, A. H. T. (1939). *Lancet*, **2**, 194.

Pyloric Stenosis in Identical Twins

It may be generally stated that identical abnormalities in dizygotic twins are no more frequent than in brothers and sisters born singly, whereas in monozygotic twins it is the rule that abnormalities are shared. Assuming that pyloric stenosis is a congenital abnormality, the above statement should be borne out by examination of recorded cases. This appears to be so (see Table).

Summary of Cases of Pyloric Stenosis in Twins (O'Donnell and Klein, 1941)

	Both Affected	One Affected
Dizygotic twins (binovular)	2	21
Monozygotic twins (uniovular) ..	10	1 + 1?*

* The two cases of monozygotic twins in which only one member was affected were reported by Lasch (1925) and Sheldon (1938). In both of these the type of twinning was substantiated by a description of the placentae, only one chorion being present in each case. In the former the diagnosis seems to have been somewhat in doubt, but in the latter a pyloric tumour was found at operation on the affected member. Observation of one feed only in the other twin revealed no evidence of pyloric stenosis.

CASE REPORT

Male twins A. C. and B. C. were born on Feb. 24, 1943. They have a normal brother aged 3. The delivery was normal, and the placenta was described as a single body with only one chorion. Both were entirely breast-fed. At four weeks A. C. started vomiting after nearly every feed, and the vomits were often projectile in character. The stools were green. He was admitted to the Hospital for Sick Children, Great Ormond Street, one week later weighing 6 lb., or 1 lb. 4 oz. below the estimated weight for age. (His brother at this time weighed 6 lb. 8 oz.) Test feeds showed that he was taking 2½ to 3 oz. per feed, given three-hourly—six in the day. On examination the ears, throat, and urine were normal. Dehydration was not evident. Observation of the abdomen during a feed showed typical "golf-ball" peristalsis, and a pyloric tumour was palpable in the right upper quadrant. Rammstedt's operation was performed by Mr. Humby under local anaesthesia and a definite tumour was found. Convalescence was uneventful, and the baby was discharged home, gaining weight, on the fourth day after operation, returning on the eighth day for removal of stitches.

B. C. has a right inguinal hernia. He is described by his mother as "never having vomited since birth." Feeds have been watched on three occasions; visible peristalsis has been seen and a pyloric tumour felt. A barium meal was given at three months, and "a definite delay at the pylorus" was reported.

COMMENT

This report presents two interesting features: (1) monozygotic twins with the same congenital abnormality; (2) pyloric stenosis present in a baby without producing any symptoms.

I should like to express my indebtedness to Dr. Donald Paterson for permission to publish this memorandum.

F. L. KING LEWIS,
House-physician, Hospital for Sick Children, Great Ormond Street.

REFERENCES

Lasch, W. (1925). *Münch. med. Wschr.*, **72**, 1155.
O'Donnell, F. T., and Klein, J. M. (1941). *Amer. J. Dis. Child.*, **62**, 1025.
Sheldon, W. (1938). *Lancet*, **1**, 1048.

Induction of Labour in Contracted Pelvis by Digital Separation of the Membranes

Although most obstetricians in this country are now agreed that the method of treatment of choice for cases of minor and medium degrees of contraction of the pelvic inlet in primigravidae is by "trial labour" and not by surgical induction before term, all must have been disappointed at the necessity for Caesarean section in those cases in which the "trial" failed because of the "more than average" size of the baby. Caesarean section, especially in the young primigravida, is a procedure which, if delivery per vaginam is impossible, is better avoided, as it limits the number of pregnancies to three, and, in fact, the patient often expresses a desire to be sterilized at the second operation.

The problem in these cases is to get the patient to go into labour while the baby is still small enough to pass through the pelvic brim. Simple medical induction by castor oil, quinine, and pituitary extract is only rarely successful before term, whereas surgical induction by rupturing the fore-waters or even the hind-waters contraindicates Caesarean section, should the latter become necessary later on for such indications as uterine inertia or foetal distress, by reason of the risk of sepsis.

The purpose of this communication is to recommend digital separation of the membranes from the lower uterine segment, and this is performed immediately before simple medical induction is begun. Separation of the membranes has been advocated by various authorities, but, so far as I know, is not generally practised. It is carried out, I believe, in the Simpson Memorial Hospital, in Edinburgh.

In cases of pelvic contraction in which bimanual examination is being carried out at weekly intervals after the thirty-sixth week, and when it is decided that the head will just mould through the brim, digital separation of the membranes by using the index finger of the right hand is performed with the usual antiseptic precautions. The membranes are cleared for as great an area as the finger can reach when introduced through the os. Medical induction is started the same day.

During the past 18 months this method has been used in this department in suitable cases of contraction of the pelvic brim, mainly where the true conjugate diameter was between 3.25 and 3.75 in. In a series of 32 such cases in which separation of the membranes, followed by medical induction, was carried out labour failed to come on within a period of 10 days in only three. The mean weight of the babies in the cases which responded was 6 lb., labour was not long, and use of outlet forceps was necessary in only two. It may be said, therefore, that labour was induced too soon, but the striking fact is that labour can be brought on by this method in the great majority of cases after the thirty-sixth week. There was one neonatal death, occurring in the first fourteen days.

The advantages of this method are: (1) Caesarean section can be safely undertaken later in labour if necessary (it was necessary in the three cases which did not respond); (2) the membranes, being intact, serve to protect the soft head as it moulds through the brim; (3) such complications as prolapse of the cord are obviated; (4) if medical induction is begun on the same day, and is repeated every third day, labour comes on within a day or two in the great majority of cases.

I have pleasure in expressing my indebtedness to Dr. W. J. Clancy for his advice and assistance, and to Dr. Rennie, medical officer of health, and Dr. James Clark, medical superintendent, for permission to publish this communication.

D. CHALMERS WISEMAN, M.B., B.Sc.,
F.R.C.S.ED., M.R.C.O.G.,
Assistant Obstetric Surgeon, City General Hospital, Sheffield.

Reviews

BODY POISE

Body Poise. By Walter Truslow, M.D., F.A.C.S. (Pp. 312; illustrated. $4.50 or 25s.) Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1943.

This is an interesting monograph of particular value both to orthopaedic surgeons and to medical gymnasts. The main theme is the emphasis on the importance of scientific training in posture—i.e., a return to the principles of the older Swedish physical culture, which in recent years has been to a large extent supplanted by games, dancing, and rhythmic exercises—in remedial work.

The book contains three sections. In the first there is an account in simple language of the normal anatomy of the skeleton, joints, and muscles, described not in terms of regions but built up from the "sole of the foot to the crown of the head." This forms a good introduction to the anatomical problems of poise. The second part deals with those physical breakdowns which are characterized by muscular insufficiency, and a detailed scheme of exercises is presented for each type of disability—e.g., weak foot, flat-foot, postural defects of the spine, and so on. In the last section there is an interesting and valuable account of body poise in its special relation to games, sports, and athletics in general.

Throughout the work a full description is given of exercise schemes which have been used by the author in his practice as an orthopaedic surgeon for many years. There is also a useful account of his methods of recording deviations from normal posture. For the most part the exercise schemes, whether designed for muscle building, posture training, or correction of deformity, are of the type used by modern remedial gymnasts. Some of the exercises are admittedly difficult, and require special instruction and supervision. In postural trajning, for example, too little use is made of the recumbent position, which most authorities regard as an essential introduction to the final scheme in the standing position. But these are minor criticisms. The book as a whole is stimulating and authoritative, and it is a valuable addition to the departmental libraries of orthopaedic clinics and remedial exercise units.

PSYCHOLOGICAL MEDICINE

Manual of Psychological Medicine for Practitioners and Students. By A. F. Tredgold, M.D., F.R.C.P., F.R.S.Ed. (Pp. 298. 18s.) London: Baillière, Tindall and Cox. 1943.

This war, like the last, has brought psychological medicine into great prominence. Men and women recruited into any of the Forces are more or less physically fit; they are on the whole allotted to jobs within their physical capacity. Medical examination for physical fitness is more thorough than for mental stability, so that psychological breakdown for that reason alone is likely to be relatively more frequent than physical breakdown among the armed Forces in comparison with the civil population. Finally, war engenders emotion, especially the emotion of fear, to a degree unknown in peacetime, so that so-called psychosomatic disorders become common, as well as disturbances that remain essentially in the mental field.

It is no doubt under the stimulus of this situation that Dr. Tredgold, whose textbook on *Mental Deficiency* has long been a standard work of reference, has produced a convenient *Manual of Psychological Medicine*. It is, as would be expected from such a source, written clearly and readably. Its sources are eclectic and sometimes unconscious. It has some Kraepelinian imprints and others of a later date, and, as is the way with imprints, they are sometimes indistinct. The allusions to Freudian doctrine, for example, do not seem to refer on the whole to its more recent developments. The discussion of the more definitely psychogenic types of illness is superficial, especially in regard to children; but the book is intended as a general handbook and not as a work for specialists.

There are some suggestions which are perhaps in these days a little unorthodox. For example, Dr. Tredgold recommends that people with anxiety states should be put to bed as a routine. There are some novel observations, such as that the administration of strychnine, which is certainly not customary in these conditions, may drive the patient to suicide. It would be interesting to have this observation documented. Spasmodic torticollis is classed as hysterical, without further comment, and the very interesting condition of anorexia nervosa is barely referred to. Confidence is expressed in the cure of traumatic neurosis by the award of a lump sum. Suicide is spoken of as a frequent outcome of obsessional neurosis, which is not a conventional opinion. A good case is made for the rehabilitation of chronic neurasthenia as a clinical concept, on a constitutional basis.

The chapter on mental defect is the masterly summary that one might expect from an author whose experience is pre-eminent in this field. He gives a healthy warning, much needed in these days of the widespread use of intelligence tests, that in themselves they are quite inadequate as a gauge of social incapacity.

RUDIMENTS OF ALLERGY

Primer of Allergy. By Warren T. Vaughan, M.S., M.D. Second edition. (Pp. 176; illustrated. 10s.) London: Henry Kimpton. 1943.

"Tradition has it that in former times when two or more ladies were gathered together they adored talking about their operations. To-day they adore talking about their allergies." To enlighten them in such discussions on this "strange and tantalizing state," and to help others to understand everyday topical remarks on stage and screen, Dr. Warren Vaughan has published a *Primer of Allergy*. The doctor or consultant is regarded as the expert in strategy; it is the sufferer alone who must conduct the campaign. The primer is designed to help such sufferer to adjust himself with the utmost success to those environmental factors which contribute to his discomfort. The subject-matter is portrayed in very modernistic military mood, with a description of the enemy (allergens), the defence of the realm (methods of combating sensitization), liaison and reconnaissance (taking inventory), plan of attack (therapeutic programme), and, finally, "victory or defeat?" Precise directions for patients suffering from each of the common allergies are set out at great length, with methods for avoiding or removing the common inhalant and food allergens, and the keeping of inhalant and food diaries—in fact everything of interest to the punctilious or scientific patient. The numerous illustrations are in cartoon fashion with a final Tom Mix-ish "farewell to allergy." The book will teach and help the sufferer to "live with his allergy."

Notes on Books

A manual entitled *Diseases of the Ear, Nose and Throat* by Dr. DOUGLAS CARRUTHERS of Sydney will prove useful as an introduction for students to clinical work in a special department. There is no attempt to treat any part of the subject in detail, but the author is doubtless aware of the kind of information his students demand. There are, however, numerous books of similar scope with which this one enters into competition, and the senior student will in due course indicate whether or not it receives his approval and meets his requirements. A sound innovation is the inclusion of a chapter on diseases of the mouth, but it is too short, consisting of less than three pages, and the author has in the same way touched very lightly on other important subjects, especially diseases of the larynx. The feature on which he lays special emphasis is methods of examination, and in this he shows his appreciation of the chief clinical need of the student and his experience as a teacher. The book is published at 25s. by Angus and Robertson of Sydney and London.

That a textbook should require six editions in less than twelve years gives ample proof of its excellence and suitability for the purpose in view. This is what has happened to *Massage and Remedial Exercises in Medical and Surgical Conditions*, by NOEL M. TIDY (Bristol: John Wright and Sons; 25s.). The general scheme of the book is a systematic presentation of diseases arranged in accordance with the various systems of the body. A brief outline of the aetiology, symptomatology, and pathology of each disease is followed by a section on treatment, in which the physical treatment is dealt with in detail, illustrated where possible by photographs or diagrams. In the present edition the chapters on fractures have largely been rewritten to bring them up to date, otherwise no particular changes have been made. At a time when rehabilitation is in everybody's mind a book such as this must be of the utmost value, and the appearance of a new edition is very timely.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY FEBRUARY 12 1944

REGULATION 33B IN PRACTICE

Much is being said and written about Defence Regulation 33B which hinders a real understanding of its purpose. This regulation, which came into force just a year ago, is in itself rather misleading. It is headed "Compulsory Treatment of Venereal Disease," and, together with the rules and directions issued under it, gives detailed instructions to special practitioners and to medical officers of health on the action they are to take if a patient names or otherwise indicates the "contact"—the person whom he (or she) suspects to be the source of the infection. This information must be kept secret, and is covered by qualified privilege in case of proceedings for defamation. The special practitioner must send particulars of the patient and the contact to the medical officer of health. If one person is named as a contact by two or more patients the M.O.H. must (if the information seems reasonably probable) serve a notice on the contact to attend for examination by a special practitioner of her (or his) choosing. Failure to obey is punishable by fine, prison, or both. If the contact is found to have communicable disease the practitioner serves her with compulsory notice to be treated; and here again she may choose her own special practitioner.

The regulation has been bombarded with all kinds of adverse criticism, particularly by certain keen voluntary workers. They say it creates a class of informers; the contact is at the mercy of an unknown accuser; she may be forcibly examined on the word of two persons who may conspire to defame her with impunity; it introduces notification of venereal disease by a side wind. More reasonable is the complaint that the regulation covers such a minute class that it is practically ineffective. Its text has been analysed by lawyers, notably by Mr. N. P. Shannon,[1] in great detail, and this scrupulous examination has produced more criticism of a different kind. Mr. Shannon, for instance, suggests that the rules do not provide with enough certainty that the patient should be warned that his name and address will go to the medical officer of health's office if he gives information. A special practitioner, moreover, may remain responsible for the treatment of a contact by a colleague, but has no right even to be informed whether the contact is duly attending for treatment. In at least some circumstances a special practitioner may be obliged to disclose confidential information in court. Mr. D. H. Kitchin points out[2] that on a strict reading of the text an M.O.H. may not disclose information concerning a contact even to a member of his staff unless for the enforcement of the regulation.

All these critics have tended to lose sight of the real meaning of Regulation 33B. The elaborate and rather repulsive procedure for compulsory examination and treatment is in fact hardly ever used. What 33B does, and is meant to do, is to help the medical officer of health to trace contacts. It ensures that he shall receive at any rate some of the information he would have if venereal disease were notifiable. He is not legally obliged to move until he has two notices affecting the same contact; but actually, in a growing number of areas, he moves on the first notice, sending a social worker to visit the contact and induce her to come and be examined. This method of informal, assiduous persuasion will do more to combat venereal disease than any other single measure. Speakers at a discussion held by the Medico-Legal Society on Oct. 28 testified that by far the most usual attitude in a suspect visited by a social worker is horror at a grim possibility which had never occurred to her, and eagerness to be cleared or cured as soon as possible. Anger, recrimination at the informer, and threats of a slander action are extremely rare. The objections to the regulation come mainly, in fact, not from the contacts but from well-meaning members of voluntary societies. The informal approach clearly does no injustice whatever to the contact, even if she has been wrongly indicated. That to facilitate it is the true object of the regulation appears from a circular recently sent out by the Ministry of Health to councils of counties and county boroughs.[3] The Minister, it says, takes the view that a local authority for venereal disease should, as a recognized and regular part of its work, do what is possible to trace contacts and persuade them to attend for treatment. To remove the legal barrier imposed by Defence Regulation 84, which enjoins strict secrecy until the information is used for the purposes of the regulations, the Minister is using the power Regulation 84 gives him to permit disclosure: he accordingly declares that information obtained through the operation of Regulation 33B may be disclosed so far as is necessary to enable action to be taken, in discharge of the functions of the council as a venereal disease authority, to trace contacts of persons suffering from venereal disease and to persuade them to undertake treatment. Approved additional expenditure on this work will rank for grant. The circular also observes that persons doing the work enjoy the same protection against actions for defamation as do persons acting under Regulation 33B—viz., in the absence of malice or indirect motives they are not open to such actions for anything done as part of their duty. With respect, this reassurance is not quite accurate. Qualified privilege does not prevent an aggrieved person from bringing an action; the M.O.H. or officer acting under him is still "open to" action, but of course the likelihood of one being brought is much less when the defence of qualified privilege is known to exist.

Another legal aspect of venereal disease practice ought to be considered. In at least one area the contacts are sought out from the clinic and not from the health office. The exponents of this plan aim to dispense with the 33B procedure, which they dislike, and especially with the notification to the M.O.H. of the patient's—the "informer's"—name. But the first words of the regulation lay down clearly that any special practitioner who receives from a patient information about the source of the disease must

[1] *Brit. J. vener. Dis.*, 1943, **19**, 22, 67.
[2] *Med. Pr.*, 1943, **705**, 264.
[3] Circular 2896, Dec. 28, 1943.

(unless he thinks the information has no substance) send the prescribed notice to the M.O.H. If the practitioner gets such information he is bound by law to pass it on. If the proper notice is duly sent to the M.O.H. an unofficial approach by the clinic staff is now lawful, but the terms of the regulation do not allow it to be side-tracked in any method of tracing contacts.

The numbers of patients and contacts affected by Regulation 33B are still lamentably small. Up to June 30, 1943—the latest date for which figures are available—110 contacts had been indicated by two patients each and so brought under the regulation; 71 of these were treated and 3 prosecuted for breach of notice to be examined or treated. About 1,780 other persons were indicated by one patient each, but only 220 of these were informally induced to undertake treatment. It is to be hoped that the Minister's information is incomplete, and that the numbers have risen during the considerable interval that has elapsed since these figures were compiled; but the reply given on Jan. 20 and reported in last week's Parliamentary Notes at page 203 adds little to our knowledge.

Perhaps as workers against venereal disease realize that 33B is meant to help them, and that its "manifest content" really matters very little, they will cease to be afraid of the bogeys that their imaginations, with assistance from legal commentators, have conjured up, and will make more use of it. The truth is that 33B belongs to a class of law that was once unknown in this country but has now come, without attracting much attention, to occupy a definite place in our legal system, and a place which will certainly become more and more important. This is administrative law: it expresses a theoretical or contingent purpose while designed to fulfil an ulterior practical one. The growing complications of life brought it forth, and the country's danger has immensely quickened its growth. No robust Earl of Halsbury now sits to challenge the rising tide; the courts' concern is to give the Executive every support and encouragement. Safeguard against abuse of power is now rather to be found in an informed and vigilant public opinion, to which Ministers are fortunately very sensitive. Venereal disease workers and others would do better to realize that administrative law has come to stay, study its purposes, and work with it as loyally as possible.

CARBON TETRACHLORIDE AND THE LIVER

The lethal effects of carbon tetrachloride, in both men and animals, have long been known to be associated with cellular damage of the liver and kidneys, but a feature which surprised the earlier investigators was the rapidity with which regeneration took place in non-lethal cases. Carbon tetrachloride in repeated sublethal doses was, comparatively speaking, also found to have remarkably low toxicity for a substance at one time regarded as the most dangerous of modern industrial solvents. More recent investigations have helped to clear up the mystery and to confirm the view that, although carbon tetrachloride is an industrial hazard liable to cause temporary disablement and severe discomfort, the rapid and disagreeable effects to which it gives rise provide some safeguard against permanent damage from repeated sublethal dosage. Even in cases of acute poisoning by ingestion the actual damage is apparently more a disturbance of metabolism than destruction of tissue, and can be prevented from becoming fatal if suitable measures are taken in time. Repeated non-lethal exposures, sufficient to cause more or less severe disturbances of health at the time, leave no permanent ill effect if the interval between them is long enough to allow regeneration. This view is supported by the results of two separate investigations—of one case of acute poisoning, and of a series of cases of chronic poisoning with gastro-intestinal and mental symptoms after repeated inhalations of high concentrations.

Since animal experiments have shown that the essential tissue damage in severe carbon tetrachloride poisoning is acute hepatic necrosis and acute nephritis, it might be expected that symptoms of poisoning in human beings would be associated with evidence of such damage, as revealed by liver-function tests and urinary analysis. The outstanding feature of subacute and chronic hepatitis is shown by Higgins and his co-workers in a paper appearing elsewhere in this issue to be a disturbance of the plasma proteins. A fall of serum albumin below 2 g. per 100 c.cm. is of grave significance, while a rise in globulin is common in all varieties of hepatitis and a persistent alteration of the albumin/globulin ratio indicates irreparable damage. In subacute hepatitis a moderate rise in serum bilirubin and phosphatase is accompanied by striking changes in the plasma proteins and a gross reduction in the laevulose tolerance. Yet in a case described by Beattie and his co-workers in our opening pages, in which acute carbon tetrachloride poisoning followed accidental ingestion of 30 to 40 ml., the only significant abnormality as shown by liver-function tests was a rise in serum bilirubin during the acute phase, although the liver enlarged rapidly. Urinary tests for albumin, sugar, bile, and urobilinogen were also negative, except for a transient appearance of urobilinogen during a relapse. The successful treatment of this case by methionine, as an intravenous infusion with a papain–trypsin digest of casein, gave further opportunity to investigate the nature of the liver damage. An attempt was made to follow the mode of action of methionine by estimating the nitrogen and sulphur balances of the patient and by determining the partition of the urinary sulphur between the oxidized (total sulphate) and unoxidized (neutral) fractions. The nitrogen balance was negative during the first two days and positive during the next two. The patient also excreted an excessive amount of unoxidized sulphur during the first two days. The suggestion is made, therefore, that during the acute phase protein synthesis in the liver was disturbed, but that this disturbance was in the nature of a metabolic derangement rather than due to an actual destruction of liver substance.

Absence of actual hepatic injury from repeated though less severe exposure has also been demonstrated in an investigation by Stewart and Witts[1] of a series of cases of "chronic" carbon tetrachloride intoxication in a factory where high concentrations of carbon tetrachloride in the atmosphere were apt to occur from spillage and leak-

[1] *Brit. J. indust. Med.*, 1944, 1, 11.

age. A large number of workers had complained of symptoms which could be sharply divided into two groups: gastro-intestinal and cerebral. Nausea, vomiting, colic, and diarrhoea were the prominent features of the gastro-intestinal disturbance, but were quickly relieved by a brief period of absence from work; and in spite of recurrent episodes there was no continuous deterioration in health. Giddiness, vertigo, acute and chronic headaches, drowsiness, alteration of the sleep rhythm, and mental hebetude characterized the cerebral effects, but these also disappeared with surprising rapidity on removal from exposure. Even in the cases with most severe gastro-intestinal disturbance—which earlier writers considered to reflect an early stage of liver damage—the blood urea, serum bilirubin and phosphatase, and the plasma proteins were all within normal limits; and the Takata-Ara reaction was negative throughout. Five cases of albuminuria had occurred among the exposed workers, but in the three eventually traced and re-examined this was not accompanied by other evidence of progressive renal disease. Radiographic and gastroscopic examination revealed hypertonicity, irregular peristalsis, and spasmodic contraction of the stomach and intestines, and hyperchlorhydria was found in more than 50% of the cases examined. It is suggested, therefore, that both the cerebral symptoms and the gastro-intestinal disturbance, bearing a strong resemblance to post-anaesthetic sickness, are the result not of liver damage but of the narcotic action of carbon tetrachloride on the cerebral cortex, as shown by mental hebetude, and of a stimulant action on the parasympathetic, or inhibition of the sympathetic, centres in the hypothalamus, as shown by the gastro-intestinal symptoms. This view of the mechanism of action of CCl_4 is not identical with the methionine hypothesis put forward by Beattie, but both investigations bring out very clearly the fact that to cause permanent liver damage the immediate toxic action of exposure to carbon tetrachloride must be repeated at short intervals. If death can be prevented by suitable treatment, as in Beattie's case, or if the dose is too small to produce definite changes in the liver, repeated exposure at long enough intervals will not cause hepatic injury. But in animals, at least, central necrosis of the liver, reversible for a time, may be followed by irreversible cirrhosis if the dosage is repeated often enough. It would therefore seem wise to ensure that, in factories where exposure for any reason cannot be prevented, the "sufficiently long interval" between exposures of workers should be achieved by alternation of work whenever symptoms appear.

STATISTICS OF INCAPACITATING ILLNESS IN CANADA

The reports on incapacitating sickness among the insured population, issued by the Health Department of Scotland for the seven years from mid-1930 to mid-1937, are well known; but, owing to the publications being less accessible, few people in this country can yet have seen the Statistical Studies of Illness in the Civil Service of Canada for the fiscal years 1936–7, 1937–8, and 1938–9, which were published in 1939 and 1940. These studies of morbidity began in 1934, and embraced the numbers of working days lost owing to illness and accidents in a population of some 35,000 civil servants, including outdoor workers connected with mining, agriculture, fisheries, and postal services. At the beginning of this work no standard code of diseases for morbidity, as distinct from mortality, was available, but the preparation of a code which could readily be correlated with the International List of Causes of Death was stimulated by studies in progress at that time of the records of pensioners from the war of 1914–18 (eventually published in 1939). The outcome was the completion of a Standard Morbidity Code for Canada, based upon the 4th revision of the International List (1929) and issued by the Ministry of Pensions and National Health in 1940. This code had been accepted as standard in Canada as early as 1936, and an index to it was prepared under the direction of Mr. J. T. Marshall, at that time in charge of the vital statistics of British Columbia and now Chief of Vital Statistics for Canada. It was employed for the Civil Service studies referred to above and is also being used in the classification of Army and pensions records in the present war. The U.S. Public Health Code, and the Medical Research Council's code in this country, are based upon the latest revision of the International List (1938), but most of the disease sections can be correlated with the Canadian code without difficulty, though the classifications of injuries will not be so easy to relate.

The Civil Service tabulations provide records over three consecutive years of the numbers of persons ill, numbers of illnesses, total days lost, and average days lost per illness from each important disease group in a population which varied little from 35,000 and included some 5,700 women. The time lost by certified illness of all kinds averaged 5.9, 5.7, and 5.9 days per person in the years 1936–7, 1937–8, 1938–9 respectively. Sick leave without certificate is allowed for three days or less at a time, up to an annual total of eight days, and such absence can be included only in the all-causes totals; in the three years it averaged 1.6, 1.4, and 1.7 days per person. Among the many diseases distinguished, "influenza" was the largest single cause of certified illness, being responsible for 33, 18, and 29% of illnesses in the three years, and for 18, 9, and 16% of the total days lost. For the respiratory type the average durations of sick leave were 11, 8, and 10 days, and for other types 8, 8, and 11 days. Approximately 2 per 1,000 of the population were absent during each year as a result of tuberculosis. "Rheumatism" showed a steady rise with increasing age as regards both incidence and time lost; for males in 1936–7 the incidence rate was 32 per 1,000 at ages 60–64, compared with 7 at 25–29.

It is impossible in a short note to do more than refer to a few of the points of interest revealed by these careful tabulations, which will provide research workers in this field with a compendium of information for many years to come. Perhaps we may hope for similar analyses of sickness records in some large industrial groups in this country after the war, if not indeed from our own Civil Service. The importance of employing the M.R.C. code as basis for all such studies to be undertaken here, so that they may be comparable as regards nomenclature at least, hardly needs emphasis.

BREAST-FEEDING

In 1942 the Minister of Health appointed an Advisory Committee on Mothers and Young Children, and at an early meeting a Health Campaigns Subcommittee was asked to consider what could be done to intensify the effort to secure more breast-feeding of infants. A report of this committee has now been published.[1] The subject-matter deals with the incidence of breast-feeding and its failure, with the arguments in favour of breast-feeding,

[1] Ministry of Health: Reports on Public Health and Medical Subjects, No. 91, *The Breast-feeding of Infants*. H.M. Stationery Office. (4d.)

and with recommendations. That there is need for more research into the physiological problems of lactation and that there should be better instruction of medical students, nurses, and midwives will be generally agreed. Improved statistical returns and propaganda through the B.B.C., women's journals, and educational films are also recommendations which can be readily accepted. It is also urged that paediatricians "or other medical officers specially interested in babies"—a phrase which might have been worded better to indicate the need for special experience—should be appointed to maternity wards or hospitals. The management of babies in such units is also considered, and alongside a plea for restricting the use of bottle-feeding was a recommendation for more elasticity in the whole routine of infant management. It is here perhaps that some doubts will arise. In a section on the paucity of statistical material the report refuses to consider the results obtained in "foreign countries," but if this means that they failed to take a look at New Zealand it is unfortunate. Whatever criticisms may be offered of the "Truby King system," it is generally admitted that for breast-feeding it is supremely successful, and it is fair to summarize it by saying that it largely substitutes detailed routine for the type of irregularity and slipshod methods that are certainly elastic. The subcommittee has apparently obtained a lot of evidence, some of which is reproduced, but its composition (two doctors out of eight members) does not carry complete confidence that the evidence has been satisfactorily probed and sifted. For example, there is a brief section in the report dealing with lamb dysentery and its prevention by early breast-feeding after immunization of the ewe. But this fact is recorded without any reference to the difference in placental structure in the different animal species and the varying importance of transplacental and transmammary transmission of immune bodies. In other words, while the recommendations are for the most part admirable, the body of the report contains material which is distinctly superficial and is, in fact, to some extent not suitable for consideration either by the subcommittee or by the main committee, which appears to contain nine medical practitioners out of a total of 30. For such a committee to state that medical students are "taught a number of shibboleths about breast-feeding" is surely going far beyond the terms of reference, and it is probably inaccurate to infer as a result of interviews with medical students "from some of the big teaching hospitals" that attendance at an infant welfare clinic is never compulsory. Methods to increase the breast-feeding of infants are undoubtedly necessary, and the report indicates clear ways in which such methods can be at once developed; but it also touches on technical matters which it does not appear to be capable of dealing with.

THE MEDICAL TECHNICIAN

We have received from the Association of Scientific Workers a memorandum on "The Problems of the Technician in Medical Laboratories": the latter term includes "hospital laboratories, industrial laboratories producing medical products, university laboratories of anatomy, physiology, biochemistry, pathology, bacteriology, etc., and laboratories of medical research institutes." It is first pointed out that this type of worker is at a disadvantage from two points of view: he cannot obtain a university degree in his subject by spare-time work, as workers may in other kinds of scientific laboratory, and his experience may not fit him for service in other spheres. It is therefore all the more important that his status should be defined and assured, and that conditions in this calling should attract and retain the right type of entrant. This memorandum makes general proposals to these ends, of which the more important are that there should be a regular system of training, a recognized qualification, and a recognized salary scale. With the first of these proposals there can be no disagreement: all junior technicians should be given the opportunity of training for higher posts, both by enabling them to attend courses of instruction in polytechnics or elsewhere and by systematic instruction from seniors in their own departments. A qualification presents greater difficulties: there are several such already, notably the diploma of the Institute of Medical Laboratory Technology, formerly known as the Pathological and Bacteriological Laboratory Assistants' Association. It is suggested here that this diploma might continue to be the recognized qualification for technicians in clinical laboratories, but that the ideal to aim at for medical technicians generally is a university diploma. This proposition and that of "encouraging part authorship of publications of scientific work in which the technician has made a constructive contribution apart from purely technical assistance" both appear to envisage a generally higher status than is now everywhere recognized. An adequate and more or less standard scale of remuneration is much to be desired: present rates vary widely, and it is no secret that valuable technicians often leave the laboratories which have trained them to enter a service where the rates of pay are much higher. We wish success to any effort aimed at bringing these things about, but more specific proposals will be necessary before anything can actually be done. It will also have to be decided first whether workers in laboratories of so many different kinds should be catered for in one scheme. There is little in common between work in an anatomy department, a clinical laboratory, a serum institute, and a factory turning out endocrine products, and no unified scheme of training and qualification can cover all the specialized types of laboratory work connected with medicine. There is something indeed to be said for having separate organizations caring for the interests of technicians in the academic, clinical, and commercial spheres.

A NEW SYNTHETIC OESTROGEN

A new series of synthetic oestrogens has been discovered in America by Blanchard, Stuart, and Tallmann.[1] The most active is 2:4-di-(*p*-hydroxyphenyl)-3-ethyl hexane, with a laboratory number of 118B, and now known as "octofollin." The authors rightly point out that this compound is not chemically related either to the natural oestrogens or to those of the stilboestrol series. Actually it is not very different from hexoestrol, the chief difference being that the two carbon atoms to which the phenyl groups are attached are not adjacent as in hexoestrol but are separated by a carbon atom to which an ethyl group is attached. It is interesting that the formula of octofollin cannot be arranged on paper to look like that of the natural oestrogens. Some of the new series can, but they are much less active. This emphasizes the fact, already well known to organic chemists, that the two-dimensional similarity between the skeletal structures of stilboestrol and the natural oestrogens is fortuitous, and has no basis in three-dimensional reality.

Clinical reports of the activity of the new compound are now appearing. Freed and his colleagues[2] found that daily doses of 1 to 5 mg. by mouth gave symptomatic relief to the majority of 35 menopausal women, three of them complaining of nausea or vomiting. Hufford[3] was unable to

[1] *Endocrinology*, 1943, **32**, 307.
[2] *J. clin. Endocrinol.*, 1942 **2**, 213.
[3] *J. Amer. med. Ass.*, 1943, **123**, 259.

produce such relief with daily doses of 1 mg. by mouth, but 2 to 5 mg. twice a week intramuscularly proved to be beneficial in 21 cases of surgical and natural menopause. There was no gastro-intestinal disturbance. The question of dosage was gone into in some detail by Roberts, Loeffel, and MacBryde,[4] who showed that even doses of 5 mg. a day only partly relieved symptoms in 50% of the cases, and that the results were not much better when doses of 15 mg. were given daily for 14-day periods with 14-day rests. These and even higher doses did not give rise to nausea or vomiting in any of their 44 patients, nor could any effect on liver function, blood, or urine be demonstrated. These authors point out that octofollin is weight for weight more expensive than stilboestrol, and 5 to 10 times less active. The advantages they claim for it are the absence of gastro-intestinal side-effects and—of theoretical interest—the fact that it does not produce leucocytosis, thrombocytopenia, or death in dogs so readily as do stilboestrol and oestradiol when administered in vast doses.

The nausea and vomiting from stilboestrol are still a vexed question. These symptoms seem to be more prevalent among American than among British patients. It cannot be too often stressed that oestrogens of the stilboestrol series are extremely active, and the doses employed are very often unnecessarily high. Stilboestrol can be obtained in tablets ranging from 0.1 mg. to 5 mg., and it is possible that an even smaller tablet should be made available. Certainly tablets of 0.1 mg. provide an ample dosage in a large number of cases. The occasional nausea and vomiting may often be overcome by lowering the dose, and cannot be attributed to any chemical property of stilboestrol *per se*, since Greene[5] has shown that large doses of an ester of oestradiol (oestradiol carbethoxylate) cause similar symptoms. It appears that nausea and vomiting and excessive oestrogen dosage go together. The absence of these symptoms in treatment with octofollin is probably due to its relative inactivity: clinicians start off with a dose that is too low and have to increase it so that adequate dosage is reached with minimal amounts of the compound. The procedure with stilboestrol is usually the other way round. The observation of Roberts and his colleagues that even in their cases successfully treated with octofollin objective signs of oestrogenic action were still lacking, in that not one of them developed an oestrous vaginal smear, shows that the dosage was indeed minimal. If symptomatic relief is attained without the production of an oestrous smear it is further evidence that stilboestrol dosage is usually too high. Taken all in all, the new compound is of theoretical interest, but its practical advantages remain to be proved.

TRAINING NATIVE DOCTORS IN THE PACIFIC

A recent visitor to this country has been Dr. V. W. T. McGusty, Director of Medical Services, Fiji, who spoke at a London conference on developments in the training of native doctors and nurses for work in the Pacific area. Dr. McGusty, who went out to Fiji in 1912, is the head of the Central Medical and Nursing Schools at Suva, which were visited by some members of the B.M.A. during the world tour eight years ago. To appreciate the work done by the school it is necessary to bear in mind the historical background. When Fiji was opened up to white traders and settlers infectious diseases, including a virulent form of measles, and also tuberculosis, were introduced, and the population steadily declined for many years, reaching its lowest point in 1919; then it began to rise again and is still increasing. The greatest danger of the early days—the seventies of the last century—was smallpox, and Sir William MacGregor, who was chief medical officer in Fiji at that time, imposed a quarantine and resolved to have the whole population vaccinated. As vaccinators he used young Fijians, who, after instruction, carried out the work so well that it was decided to make more use of them, and they became dispensers in the hospitals and carried out a service as medical auxiliaries. They were the forerunners of the native doctors of the archipelago to-day. In 1910 a system of training Fijian nurses was introduced, and there is now at Suva a nursing school with 100 pupils. The standard of the diploma is not equal to that of the State-registered nurse in this country, but that is because the general school education has not provided the native with sufficient educational background. The same is true of the native doctor. After the last war the International Health Division of the Rockefeller Foundation provided funds which enabled the Central Medical School at Suva in 1928 to open its doors to students from all the British administrations of the Western Pacific—Western Samoa, Cook Islands, Tonga, Gilbert and Ellice, and the Solomons, also from the condominium of the New Hebrides, and some Maoris from New Zealand. All the staff of the Suva hospital are teachers in the school, where the native students are given a four-years course in medicine, surgery, and public health. On qualifying they receive a restricted registration, having force only in the islands of the Pacific. These native doctors are not normally allowed to practise except as members of the Government service, which appears to give them the opportunity of a useful career. They provide a type of medical service within the economic capacity of the rather impoverished Fijian administration, and it is an advantage that they are of the social class of the natives themselves. The number of students in the medical school at any one time has hitherto been about 46, but it is to be increased to 76, including 8 dental students. Some of the Suva-trained doctors are already running their own hospitals. One Fijian native doctor has taken the full qualification at New Zealand University (entitling him to practise without the geographical limitation) and another is in training.

THROMBOSIS OF CENTRAL RETINAL VEIN

Since Holman and Ploman reported favourably in 1938 on the use of heparin in thrombosis of the central vein of the retina this drug has been tried out in cases of what is generally a progressive condition. The condition, however, is relatively rare. Huggett and Juler[1] reported in 1942 on 7 cases and Rosengren and Stenström[2] have given their experience with 30 cases. Neither report bears out the early hopes; good results are exceptional. In an analysis of end-results in 32 untreated cases Huggett and Juler find that such little improvement as they noted in their 7 treated cases is paralleled by those untreated, and they stress that the administration of heparin is not without risk. Rosengren and Stenström observed improvement immediately after treatment in 21 of their cases, but this was not maintained when the patients were re-examined. These results—and early treatment does not seem to influence them materially—bear out the belief that what passes clinically as thrombosis of the central vein of the retina is frequently a blocking of the vein from intimal proliferation.

Dr. Arthur Harold Gale will deliver the Milroy Lectures before the Royal College of Physicians of London on Tuesday, Feb. 22, and Thursday, Feb. 24, at 4 p.m. at the College, Pall Mall East. Subject: "A century of changes in the mortality and incidence of the principal infections which cause death or disability in childhood."

[4] *J. Amer. med. Ass.*, 1943, **123**, 261.
[5] *Amer. J. Obstet. Gynec.*, 1941, **42**, 858.

[1] *Trans. ophthal. Soc. U.K.*, 1942, **62**, 123.
[2] *Acta ophthal.*, 1942, **20**, 145.

DIPLOMA IN PHYSICAL MEDICINE

Regulations by English Conjoint Board

Paragraph 7 of E.M.S. Memorandum No. 6, on "The Organization of a Hospital Rehabilitation Department," issued by the Ministry of Health, reads: "Wherever possible, it is desirable that the various activities connected with rehabilitation should be under the personal supervision of a single member of the medical staff, whose duties include the maintenance of general oversight of the exercises, etc., given to patients, the prompt examination of anyone complaining of pain or other unfavourable reaction, and the holding of regular conferences with members of the rehabilitation staff. Such supervision is essential to success, and in no sense interferes with the continuity of control exercised over the individual patient by the original physician, surgeon, or obstetrician who orders rehabilitation therapy, and with whom the medical supervisor works in close association."

In this connexion it may be noted that the Conjoint Board in England has recently published the regulations for a Diploma in Physical Medicine granted jointly by the Royal College of Physicians of London and the Royal College of Surgeons of England (D.Phys. Med., R.C.P.&S.Eng.). These regulations, copies of which may be had post free from the Secretary, Examination Hall, 8, Queen Square, W.C.1, provide that (*a*) the examination is open to practitioners of not less than three years' standing who have held recognized hospital appointments and have completed a course of full-time special study extending over twelve months; and (*b*) the whole examination, which is divided into two parts, must be taken in the first instance, and subsequent admission to Part II is, of course, dependent on success in Part I. A syllabus indicating the scope of the examination is published in the regulations.

Since there may be some candidates whose experience, either in one of the Services or in the E.M.S., during the last three or four years may have been sufficient to justify their admission to the examination under the provisions of Regulation 6, arrangements are being made to conduct the examination for the first time in July next. Applications for admission to the examination under these provisions must be accompanied by original certificates (which will be returned), setting out the experience on which the application is based, and must reach the Secretary not later than Friday, June 16. The fee should not be forwarded until notification is received that the application has been approved and admission to the examination granted.

AFTER-CARE OF SERVICE PSYCHIATRIC PATIENTS

A scheme of after-care for men and women invalided out of the Services on account of psychiatric disabilities is announced by the Board of Control. The Service Departments and the Ministries of Health, Pensions, and Labour have co-operated in drawing up the scheme, and the organization of the work in England and Wales is to be undertaken by the Provisional National Council for Mental Health in collaboration with the Mental After-Care Association. The scheme will cover neurotics, psychoneurotics, and psychotics who no longer require in-patient treatment but who need further medical treatment and advice or help in finding employment or in adjusting themselves to civilian life. Officers commanding Service psychiatric hospitals and establishments and the medical superintendents of E.M.S. Neurosis Centres will notify the Board of any patient about to be discharged from the Services and returning to an address in England or Wales who needs after-care and is willing to receive it. This notification, accompanied by a report from a trained social worker allocated to each of the hospitals and centres by the Provisional National Council, will be forwarded by the Board to the P.N.C. to be dealt with by the latter's regional social worker. This officer will visit the patient at home and take any further steps necessary, acting in co-operation with the patient's own doctor and the local authorities and Government Departments concerned. A scheme on similar lines is being organized by the General Board of Control in Scotland, and one is under consideration for Northern Ireland.

The first series of scholarships for nurses which the Hospital Saving Association is providing out of its 21st birthday funds (July 31, 1943, p. 147) will consist of two scholarships for nurse dietitians of approximately £250 each; four for nurse teachers of £200 each; four for health visitors of £105 each; twelve for industrial nurses of £65 each; and four for midwife teachers of £75 each. They will be awarded annually over the next four years, will be open to nurses who are on the general part of the State register and have trained in hospitals within the area of King Edward's Hospital Fund, and will be available at any of the recognized training centres. Candidates will be required to sit for a competitive examination. Application forms may be obtained from the Royal College of Nursing, 1A, Henrietta Place, Cavendish Square, W.1.

Reports of Societies

PHYSIOLOGY OF FAINTING

At a meeting of the Section of Anatomy and Physiology of the Royal Academy of Medicine in Ireland in Dublin last November, with the president of the section, Prof. E. J. CONWAY, in the chair, H. BARCROFT, O. G. EDHOLM, J. MCMICHAEL, and E. P. SHARPEY-SCHAFER presented a paper on changes in the circulation during fainting.

At the onset of fainting, it was observed, the heart slowed and the blood pressure fell steeply to a low level. Measurement of the cardiac output by the direct Fick method in seven subjects showed that during fainting cardiac output was not further diminished and might increase. The fall of blood pressure was therefore not of cardiac origin, but was due to vasodilatation. In a further investigation of the effects of a controlled haemorrhage of approximately three-quarters of a litre, three subjects fainted while the forearm blood flow was being recorded by the Lewis Grant plethysmographic method. In all cases forearm flow increased during fainting. The combination of increased forearm flow and fall in blood pressure signified marked vasodilatation in the forearm during fainting. In view of the intense pallor of the skin the site of the vasodilatation was likely to be in the skeletal muscle.

In another series of experiments the effect of sympathectomy was produced by anaesthetizing the deep nerves to the forearm musculature. There was a high initial blood flow, as all vasoconstrictor impulses were removed. During fainting the blood flow fell steeply with the descent of the blood pressure, and recovered as the blood pressure rose. It was concluded that the fall of blood pressure in fainting was due to a peripheral vasodilatation of muscle vessels, and that the dilatation was of nervous origin.

Nerves in Joints

Prof. M. A. MACCONAILL, in a paper on nerves in joints, said that the following conclusions appeared to be justified by the results of the methylene-blue techinque of G. Weddell:

1. The synovial membrane is everywhere a sensitive membrane, but not one with so high a degree of localization as the skin.
2. Both pain and phasic sensations are subserved by the intra-articular structures, including the menisci.
3. The fatty pads (Haversian glands) are structurally fit to act as manometers of intra-articular pressure, in addition to their function as stream-lining elements of the joint cavity.
4. The arterial vessels, especially those of the fatty pads, have a liberal nerve supply, including adventitial nerves; this supply ceases at the capillary level.
5. The nerve-endings observed were of the non-encapsulated type only, even those on the special ligaments. Musculo-tendinous endings of the Golgi-Mazzoni kind were, on the contrary, seen at the musculo-capsular junctions of the extensor genu muscles.

SQUINT

At a meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health in January, with the President, Dr. MARJORIE BACK, in the chair, Mr. C. L. GIMBLETT spoke on squint, and Miss IRVINE, senior orthoptist, R.A.F., demonstrated the synoptophore.

Mr. Gimblett showed how the various theories concerning the cause of squint could not be made to fit in with the facts until binocular vision was taken into consideration. Mr. Claude Worth had discovered three stages of binocular vision in the squinting child: (1) simultaneous perception; (2) fusion; (3) stereoscopic vision. In answer to questions Mr. Gimblett said that all cases of squint were not suitable for orthoptic treatment. Rest periods were given at suitable intervals, but the young child was not discharged from the orthoptic department until he could read and be trained to accommodate properly. The ideal age for orthoptic treatment was 5 to 8 years, but a child should be sent for examination as soon as the squint was noticed. Any error of refraction should be corrected and amblyopia prevented. If the squint was neglected for two or three years, then much of the time spent in the orthoptic department would be taken up in improving vision in the amblyopic eye. Vision in the worse eye must be at least 6/12 before orthoptic treatment could be started.

Correspondence

Dietary Injury of the Liver

SIR,—We have read with interest in your issue of Jan. 29 the article by Dr. Joseph Gillman entitled "Effects on Rats of Prolonged Feeding with the Staple African Diet." Dr. Gillman reports that rats given a diet of maize meal and sour milk develop a "nodular cirrhosis" of the liver, which usually involves the left lobes of the organ. We have produced a similar lesion by means of diet. The lesion in question, however, is not a cirrhosis in the strict sense of portal cirrhosis; it is the condition of nodular hyperplasia, and it is the sequel to massive hepatic necrosis. In our animals we have produced every stage of the lesion from acute yellow atrophy through post-necrotic scarring to nodular hyperplasia. We have been able to show that this massive hepatic necrosis, with its sequel of nodular hyperplasia, is a deficiency disease due to lack of a constituent of protein, and that according to the degree of deficiency the condition involves the whole organ or only the left lobes. The experimental results giving the proof of this statement are now in the press and will be published shortly. —We are, etc.,

H. P. HIMSWORTH.
L. E. GLYNN.

U.C.H. Medical School, London, W.C.1.

Research in Ophthalmology

SIR,—Because of its essential truth no critical reply to your admirable annotation on research in ophthalmology appeared to be called for. At the same time there is much to be said on the issues raised by Mr. Lionel Green (Jan. 29, p. 158). These are research, the conditions of hospital appointments, and postgraduate training. He advocates the creation of a central co-ordinating institution, and many ophthalmic surgeons who have given consideration to these matters will agree that an active voluntary body of this nature would be of great value. The practical application of basic research is seldom found within a decade, and may meet violent opposition from vested professional interests. Even in clinical matters progress may be slow—for example, squint has been treated with stereoscopic devices for over a hundred years and the term "orthophthalmic practice" was applied to this form of treatment in 1841. The orthoptic board came into being some ninety years later.

Much basic ophthalmic research has been carried out during the past decade in this country, but not by clinicians. If the approval of this state of affairs had been only tacit, it is unlikely that during the period foundations designed to remedy the defect would have been established in Edinburgh, Glasgow, London, and Oxford. In each case close collaboration is maintained with hospitals and laboratories, and already from these areas the output of work is notably increasing. Some of this research is referred to in your leading article. These foundations are not restricted in nature and they are not isolated. More than a genuine interest in the academic side is required before the clinical ophthalmologist is likely to contribute anything to basic ophthalmic research. The combination of qualities required is not a common one. To give one example, all over the world a few clinical observers are anxiously awaiting the discovery of a sex-linked blood group. The response of medical ophthalmic practitioners to such a discovery would not be an immediate one. It might take at least a decade before they would realize its significance. There is nothing derogatory in this; it means that basic observations have a different appeal to different types of observer.

Most specialties in this country have historical associations with one or other of the Royal Corporations. In ophthalmology the recognition of the M.R.C.P. for responsible appointments in London would be a practicable step which might meet some of the difficulties. The position is rather different in Scotland, where greater weight is attached to university qualifications than is the case in England. The statutory recognition of exclusive specialist bodies within the medical profession is not likely, and would tend to perpetuate rather than diminish the very real disabilities to which attention has been drawn by your correspondent. There is a branch of medicine devoted to ophthalmology, but I hope that this will never become an "ophthalmic profession."

The present position regarding all higher qualifications is, of course, at present under review. It is certainly confusing. The young ophthalmologist can take at least three diplomas in ophthalmology and three surgical fellowships with his specialty as a part of the examination. The majority collect only those which are necessary for the areas in which they propose to practise. If the younger men are not correctly advised, much time may be wasted and unhappiness arise. A similar position may occur in other branches of medicine, and might be greatly improved by the creation of a common conjoint examining board of all the bodies concerned in granting such diplomas, with a system of exchange examinerships. This would ultimately lead to uniformity, and the candidate could attain either fellowship or membership standard. —I am, etc.,

W. J. B. RIDDELL.

University of Glasgow.

Qualities and Limitations of Proflavine

SIR,—I have been much interested in recent discussions upon the use of proflavine in the treatment of wounds. There has been a good deal of adverse criticism of it, which I believe is due to a misunderstanding of the limitations of this most useful and non-irritating antiseptic.

I have used proflavine very extensively over many years—both in hospital and in private practice—ever since it was first brought to my notice by Prof. Carl Browning, the discoverer of proflavine and at that time professor of pathology at the Middlesex Hospital. I speedily found it by far the most efficient and satisfactory antiseptic I had ever come across, and I came to use it as a routine dressing in all ophthalmic operations, its great value lying in its strong bactericidal qualities coupled with its being completely painless and non-irritating. I always used it in a strength not exceeding 1 in 2,000, and this solution was sprinkled freely upon the gamgee dressing, while on completion of the operation I always freely dowsed the eye with the solution before applying the dressing. By this simple method it was possible to avoid with certainty that bugbear of ophthalmic operations—viz., contamination from the lash area. One can use a solution of 1 in 1,000 with equal safety, but as I experienced ample protection with the weaker strength I preferred the latter.

Proflavine, however, has very pronounced limitations. In the first place it is purely an antiseptic in the true sense of the word, and is not a remedy to employ when infection is already obviously present. Thus it is a bad drug to use in acute purulent or semi-purulent inflammations, because it has little or no penetrative power. Moreover, its usefulness is not in a direct ratio with the strength of the solution employed; on the contrary, I found that no advantage was gained by using solutions stronger than 1 in 1,000, and, in fact, even at that concentration it was liable, if used continuously over more than a very short period, to inhibit the healing of a wound. In a still stronger solution I can well believe it becomes increasingly unsatisfactory, and its combination as a powder with sulphathiazole, which has been tried with very unsatisfactory results, is entirely contraindicated. In short, proflavine cannot be surpassed when the object is to prevent contamination from an outside source, but is inferior to other remedies when one has to deal with any widespread infection already present.

As regards the value of acriflavine as compared with proflavine, I formed a very definite impression that while acriflavine is just as efficacious in its antiseptic properties as proflavine, it is apt sometimes to cause irritation, which proflavine never does when used as I have suggested.—I am, etc.,

ARNOLD LAWSON.

London, W.1.

Suprapubic Cystotomy in Bladder Paralysis

SIR,—In spite of the teaching of the majority of urologists there are still surgeons who advocate the tied-in catheter instead of an early suprapubic cystotomy for the treatment of the paralysed bladder. The authors of an article on fractures of the spine published in a recent issue of an important journal of surgery show such a lack of knowledge of the dangers of

the use of the catheter that I am prompted to write this letter. In lectures at the Postgraduate Hospital at Hammersmith I have impressed upon my audiences that the tied-in catheter gravely endangers life. The late Sir John Thomson-Walker called this treatment one of the great surgical failures of the 1914–18 war. In one of the best papers ever written on this subject Riches has put the case quite clearly for early suprapubic drainage. Barrington and Everidge are others who have been outspoken in their criticism.

We have to prepare for heavy casualties in the coming months, and there may be many cases of bladder paralysis. It is quite unnecessary to allow the same terrible bladder sepsis as was seen in 1914–18 in France, and subsequently at the Star and Garter Hospital, Richmond.—I am, etc.,

London, W.1. CLIFFORD MORSON.

Social Factors in Aetiology of Burns

SIR,—I should like to emphasize the importance of social factors in the aetiology of burns and scalds, as mentioned in the article by A. W. Wilkinson (Jan. 8, p. 37). At the instigation of Prof. Macintosh and Dr. Leonard Colebrook an investigation was made of the social circumstances of 50 cases of burns and scalds admitted to Glasgow Royal Infirmary under the care of Mr. A. M. Clark (Dec., 1942, to March, 1943). The investigation included home visiting and, where practical, a personal interview with the patient and witnesses.

Forty-five cases occurred in domestic circumstances. In 80% of these the patients were under 14 years of age. This preponderance of children is in large part explained by the social conditions in which they live. The most common factors found were: (1) overcrowding; (2) lack of fire protection; (3) poor housing conditions combined with low-grade intelligence and/or carelessness on the part of the responsible adult.

Judged by the standards of the Housing Act, 1936, there was overcrowding in 23 of the 45 homes. Of the 45 families, 14 lived in single-apartment houses—i.e., a single room—and 24 in two apartments. Even the meagre furnishings of many of these homes so completely filled the small available floor space that the only free area—where a child might play—was immediately in front of the fireplace. Despite the terms of the Children's Act, 1908, in not one of the 45 homes was there a fireguard; yet in 39 of these there were children under 7 years of age. It is worthy of note that 19 of the accidents would have been impossible and 5 improbable had there been adequate fire protection. It is thought that this lack partially explains the higher percentage of burns, giving a burn-scald ratio of 2:5. Carelessness on the part of adults in the placing of cooking utensils, gas rings, etc., combined with poorly constructed or ill-repaired fireplaces, were frequent findings. Poverty as a single cause was found to be unimportant.

Thus I heartily agree with Wilkinson's statement that "the problem of burns is primarily a social one, which, it is believed, can best be solved by suitable educative propaganda." To this I would add a plea for better housing conditions, and, perhaps, the more rigorous enforcement of the 1908 Children's Act.—I am, etc.,

Weybridge. MARION T. WRIGHT.

Umbilical Hernia in Children

SIR,—I have read with interest Mr. M. J. Bennett-Jones's article on umbilical hernia in children (Jan. 15, p. 78), especially regarding the congenital type or exomphalos, and heartily agree with his views on operation being performed a short period after birth in these cases.

During the past twelve months I have operated on three such cases admitted to Llandough Hospital, Cardiff. The first infant was about four hours old and presented a very large exomphalos. Unfortunately it died eight hours after the operation, apparently from secondary shock. The second infant was approximately twelve hours old. The hernial sac contained practically the whole of the small gut together with the caecum. Reduction was not very difficult and the child made an uninterrupted recovery. The third child was submitted to operation 4½ hours after birth. The sac contained a large amount of small and large gut, and the child's post-operative progress was uneventful. In all three cases operation was conducted under light open ether anaesthesia, the sac being cut away, the gut rapidly reduced, and abdominal closure performed with through-and-through sutures of silk-worm gut.

Prof. G. Grey Turner (*Modern Operative Surgery*, 3rd ed., vol. II, p. 1085) states that if the condition does not rapidly recover after birth operation should be carried out without delay, and Hamilton Bailey (*Emergency Surgery*, 5th ed., p. 291) stresses that success depends upon operating a few hours after birth. It is generally agreed that when the sac contains all or a large portion of the liver operation is useless, as it will be found impossible for the coelom to contain all the viscera. Furthermore, in complete exomphalos the child survives only a few hours, and it is the cases of partial exomphalos which should be submitted to early operation.—I am, etc.,

Cardiff. D. B. E. FOSTER.

Tractor Fracture

SIR,—I was called recently to deal with a compound fracture of both bones of the right leg in a young ploughman. I was puzzled to know to what to impute the damage, particularly as the man told me that his foot had slipped off a pedal, and that a "jolt" had simultaneously thrown such a strain upon his leg that it snapped. On further inquiry, however, I find that there is a control lever on the plough, which has to be "handy" to the driver, and that when he tried to reverse his machine rather fast, this had swung in and given him such a severe blow as to cause this serious injury. I have made inquiries, and have discovered that there is a distinct probability of this accident happening unless ploughmen are warned against turning too sharply while using a particular type of tractor, and that it would be quite possible to design a body with a driver's seat which would not lay the ploughman open to incurring this form of injury. Particularly in these times any way of decreasing workers' accident-proneness seems to be very thoroughly indicated.—I am, etc.,

F. O. TAYLOR.

Treatment of Sciatica

SIR,—Sir Arthur Hurst asks, "What is sciatica?" and answers, "By sciatica is meant pain in the distribution of the sciatic nerve, which was formerly thought to be almost invariably caused by inflammation of the interstitial tissue of the nerve, except for a small number of cases of referred pain from disease of the hip-joint." This is simple enough, and was generally accepted as a guide for treatment until recent years. Dr. James Collier, physician to the National Hospital for Nervous Diseases, Queen Square, described the pathology of interstitial neuritis of the sciatic nerve in these words in 1930:

"The morbid anatomy is well seen when the nerve is exposed during operative procedure for the relief of the condition. The affected nerve is swollen and pink in colour, the sheath is distended and drops of fluid exude when it is incised, and sometimes the nerve is adherent to the surrounding tissue. The inflammatory condition may be local and appear as a pink bulbous enlargement of the nerve trunk, or spread widely over a long stretch of the nerve trunk or its branches."

The term "sciatica" was confined by Collier to interstitial fibrositis of the sciatic nerve, to the exclusion of every other variety of sciatic pain resulting from pressure on nerves or nerve roots or other lesions of the nervous system which have been included as secondary sciatica.

Until recent years the diagnosis and treatment of sciatica were the province of the physician or neurologist. An excellent account of the methods of its diagnosis and treatment at that time was given in vol. III of *Modern Technique in Treatment*, pp. 100–5, published by the *Lancet* in 1927. It was written by Dr. J. P. Martin when assistant physician to the Hospital for Nervous Diseases, Queen Square. He defines sciatica as an inflammation of the interstitial tissue of the sciatic nerve or its roots. This is the true neuritis, and a correct diagnosis is essential. In sciatica the nerve is always tender, and since it sends no branches to the front of the thigh any condition in which pain extends to this region is not due to sciatica alone. For treatment the patient must be kept warm in bed, heat to the limb being applied by "thermogene" wool or other

method such as diathermy. If there is no definite improvement in a month or six weeks injections of normal saline into the nerve trunk is recommended, and if the roots of the sciatic appear to be specially involved injection into the epidural space within the sacral canal might be tried. This treatment was introduced by a Viennese doctor in 1922, who used a 40% solution of antipyrine. This is a painful process, and it was usual to inject 1/4 gr. morphine beforehand and to anaesthetize the area by local injections of novocain and subcutaneous injection of oxygen. This is described by Dr. Martin, who mentions that this method was introduced 2 or 3 years previously, but does not say by whom. He describes the method of injecting oxygen from a cylinder via a wash bottle with warm water into the subcutaneous tissue over the sciatic nerve until the surrounding tissues are thoroughly distended and ballooned, when the needle is withdrawn and the process repeated lower down. When the emphysema has disappeared in the course of 2 or 3 days, the same process may be repeated. These injections often give "the most surprising relief," and "its extreme simplicity makes it always worth trying." The oxygen treatment was also recommended by Dr. Collier and described by him in *Price's Textbook of Medicine*, 3rd edition, p. 1656, as "a simple and harmless process which is quite painless and often brings most surprising relief."

I can thoroughly endorse these opinions from my personal experience. Patients with severe sciatic neuritis who had been confined to bed and completely disabled for many months, when other forms of treatment such as injecting saline into the nerve, and even in one case epidural injection into the sacral canal, had failed to remove the pain, have been completely cured, and able to walk with ease and resume their occupation after 2 or 3 injections of oxygen. It seems quite likely that equally good results might be obtained in treatment of chronic brachial neuritis. Dr. C. P. Symonds, also assistant physician to the Queen Square Hospital, takes an entirely different view of sciatica and its pathology and treatment. At a meeting of the Royal Society of Medicine he stated his conviction that a prolapsed intervertebral disk was by far the most frequent cause of sciatica, and that he is unaware of any pathological evidence that true sciatic neuritis ever gives rise to sciatica; and makes the surprising statement that "the vision of an inflamed and swollen sciatic nerve, so confidently stated to be the cause of the syndrome in question, has never yet been granted to human eyes." Does this refer to Dr. Collier's statement of the pathology as published a few years previously and mentioned above? Sir Arthur Hurst in his recent article says that prolapse of the nucleus pulposus of the 4th and 5th lumbar intervertebral disk is believed by all "neurosurgeons" and by some neurologists to be a common cause of sciatica.

Fortunately some neurologists still believe in the truth of the older pathology, and in that the term "sciatica" should only be used to signify interstitial neuritis of the sciatic nerve. For example, Dr. F. M. R. Walshe, also physician to Queen Square Hospital, writes in *Price's Medicine*, 1941, 6th edition, p. 1773, that "acupuncture of the nerve with a series of specially designed needles is a useful and ancient remedy, which acts by puncturing the sheath of the nerve and allowing the escape of inflammatory exudation." Probably Walshe is referring to the words of Fagge and Pye-Smith in 1921, as quoted by Sir Arthur Hurst: "For immediate relief the deep injection of morphine over the nerve is the most effectual treatment. Not infrequently we see suffering which has been almost intolerable thus removed as by magic within a few minutes." And Osler in 1912, after mentioning this treatment and also the injection of chloroform into the nerve, adds: "It is remarkable how promptly in some cases the injection of distilled water will relieve the pain." He also advised trial of acupuncture: "The needle should be thrust deeply into the most painful spot for a distance of about 2 in. and left in from 15 to 20 minutes."

It would seem that the ultra-modern ideas may have been influenced by the storms and stresses of war, and that when peace at last returns the clouds may be dissipated and a more sane and rational view of the nature of sciatica and its treatment will hold the field once more. Perhaps the subcutaneous injection of oxygen may again be restored to favour.—I am, etc.,

Worthing. HERBERT H. BROWN.

Aetiology of Sciatic Pain

SIR,—May I trespass briefly on your space to endorse the remarks made by Mr. N. Ross-Smith (Jan. 15, p. 90). My series of cases—some 500—is much smaller than his, but judging by the frequency with which such patients are seen there are few subjects of more importance than pain in the back associated with pain in the leg.

Of the many causes which must exist for referred pain of this type four stand out plainly to me, so far as my observations have gone: (1) Pain in the back from a torn lumbar aponeurosis with adhesions, associated with reflex sciatic neuralgia. I think that all those cases which are variously referred to as sprains of the sacro-iliac joint, occupational strain, subluxated sacro-iliac joint, etc., can be included in this class. (2) The "sciatic scoliosis" syndrome, which, in my experience also, is rarely seen outside the age group 20–40. While many of these cases are due to posterior disk rupture there must be many other causes also. However this may be, the clinical syndrome of sciatic scoliosis is unmistakable. (3) Patients beyond the age of 40 with osteo-arthritis, spondylitis, or other condition of the lumbar spine which implies degeneration of bone and cartilage, from whatever cause. (4) An unclassified group of individuals in which the pain in the back and leg is associated with some minor congenital defect such as spina bifida occulta, sacralization, or an increased number of lumbar vertebrae. It seems to me probable that in a large number of these cases there is a psychological element, and it is open to argument whether this is merely a precipitating factor or the main cause of the trouble.

Mr. Ross-Smith's remarks about the straight-leg-raising test interested me particularly. This has always seemed to me to be a clinical sign of the greatest significance, but I have not yet been able to differentiate the pain which occurs in the leg so accurately as he does for the different varieties of lesions, and I am inclined to think that in any condition where the great sciatic nerve is irritated, from whatever cause, this clinical sign will hold good. When the question of treatment is considered, thoroughness of examination and accuracy of diagnosis become ever more important. Cases which I have included in my first category respond very well to manipulation. Of the second type some 80% can be cured by a head suspension plaster jacket, and on few occasions do I find it necessary to carry out a laminectomy and remove the disk; nevertheless when this is necessary it does produce a very good result. I am entirely in agreement with the suggestion that myelography should in any case be followed by laminectomy, and that this method of examination is not infallible; I am beginning to wonder if it is really necessary. The osteo-arthritic type of case in my experience invariably responds to simple fixation in an ordinary plaster jacket.—I am, etc.,

Liverpool. E. N. WARDLE.

Sciatica

SIR,—Such articles as that of Sir Arthur Hurst on sciatica are much welcomed by the profession; they help to keep us on an even keel. And such carefully written and well-reasoned letters as that of Prof. Platt command our attention and respect. But surely the letter written by Mr. Blundell Bankart calls for criticism. Mr. Bankart is writing a letter to be read by medical practitioners and not medical students, and his dogma and dictatorial attitude are not acceptable.

Does not sciatica always go? Has anyone ever had sciatica for a lifetime? General practitioners are constantly treating thousands of cases of sciatica which right themselves. One cannot help wondering if Bernard Shaw had heard of the prolapsed intervertebral disk whether he would have substituted "nucleus pulposus" for "nuciform sac." One cannot help feeling a degree of fear for the sciatic patient who falls into the hands of the orthopaedic surgeon. Is not the common cause of sciatica "rheumatism"—whatever that is? The bulk of patients start off with muscular rheumatism in the back, lumbago, fibrositis, or what you will, and later get pain down the nerve, with corresponding tenderness. Unfortunately, if severe pain is sufficiently prolonged the patient becomes impatient. It rather appears that he will have to be careful

how he treads in future, or he may lose an intervertebral disk. One wonders how many doctors and orthopaedic surgeons with sciatica would sacrifice a disk.—I am, etc.,

Rotherham. ERIC COLDREY.

SIR,—The analogy between shingles and sciatica is too close to exclude the possibility of both these conditions being akin. By sciatica I mean the sudden crippling pain along the course of the sciatic nerve which goes after a week or two "on the club," from which the patient recovers totally, whether assisted by our remedies or not, but in which the pain is acute enough to need a pain-killer, at times even morphine injections. This sciatic pain comes on suddenly; often the patient complains of a "chill," which, I take it, is fever, and at times the temperature is raised. The pain is invariably unilateral, as is the pain in shingles. Any continued pain in both sciatic regions would not be called sciatica by a general practitioner, but would promptly raise the suspicion that something serious was responsible.

I have never known a patient die from what I recognize as sciatica, and whether there is anything known of the pathological condition I do not know. I doubt if there is any pathological evidence. I certainly think that there is some ground for believing that possibly a virus, such as causes a common cold, may at times attack some element in the lower cord, as happens in shingles in various parts of the body. Certainly none of the theories so far explains the invariable one-sidedness of the condition or the invariable complete recovery. In fact one may say that if recovery does not happen in a week or two the condition is not "sciatica," but one of the various conditions so far mentioned by your correspondents. —I am, etc.,

Crewe. W. L. ENGLISH.

More Light on the B Complex

SIR,—The following remarks are prompted by the annotation on this subject in the *Journal* of Jan. 15 (p. 85).

In a series of communications during the last 20 years (for references *vide* McGowan, 1942) I describe a condition in young pigs—"iron deficiency"—caused by a relative deficiency of iron in the mother sow's milk. It appears in suckling pigs during the first 3 or 4 weeks of life, and is characterized by white diarrhoea, pallor of skin, adiposity, and anaemia, with fatty change in and subsequent disappearance of the cells of the central areas of the liver lobules. The condition is preventable, and curable in its early stages, by the administration of iron. If, however, it is allowed to run its course unchecked, one of the major sequelae which develop in certain cases is another type of anaemia, due to the progressive destruction of the liver lobules from the centre outwards. This anaemia is unaffected by treatment with iron, but responds in dramatic fashion to the administration of liver or liver extract. The symptoms comprise pallor—sometimes there is jaundice—anorexia, vomiting, cyanosis, dyspnoea or "thumps," and often sudden death. There is some emaciation without, however, lack of skeletal growth.

Chick *et al.* (1938), on finding that a condition in the pig resembling that just described was curable by the administration of nicotinic acid, alleged that it was pellagra. I pointed out, however (1938, 1939), that the onus of showing that it was not simply this "iron deficiency" sequela rested on them. The same obligation would seem to be binding on Wintrobe *et al.* (1942) in their study of thiamine deficiency in swine. The symptoms as described are those of the "iron deficiency" sequela—"anaemia of moderate or even severe degree was observed in several pigs" (p. 148); as estimated on only one occasion, and this at the time of death, the red blood cell count in 17 pigs was (with one exception in each of the 4 groups) definitely, sometimes markedly, below normal. Haemoglobin was not determined in any of the cases at any stage. The statement, apparently based on naked-eye observation, that "no chronic passive congestion of the liver was found" (p. 156), while an incorrect description of the pathology of the liver changes to be looked for in "iron deficiency," does not exclude the possibility that changes, past or present, of the liver parenchyma might have been observed if a microscopical examination had been made. Moreover—and this is very important—the pigs were weaned and fed on a highly unnatural diet at 3 weeks of age—that is to say, very early in life at a time when milk should still constitute the major portion of their diet, and, further, at a very critical stage of their existence, when, if this "iron deficiency," possibly well established during the previous 3 weeks, were to be prevented from further development, a diet of natural foodstuffs and one containing a large amount of iron was an absolute necessity. The statement by Wintrobe *et al.* (1940) that the pigs frequently had diarrhoea during the first few weeks of weaning supports, if indeed it does not prove, this thesis.

Such cases are examples, additional to those provided elsewhere (1939a); illustrative of the fallacy of concluding that because a substance cures or ameliorates a condition the previous absence of the substance (from the diet) must have brought it about. They also emphasize the importance of ensuring that experimental animals are quite healthy before being subjected to experiment. I cite (1941) a case in which rabbits, suffering from acute intestinal coccidiosis, were employed in observations from the results of which it was alleged that the addition of calcium to a ration of barley and bran conferred on the rabbits receiving it protection from the effects of an intravenous injection of human tubercle bacilli. I also refer (1933, 1940) to instances where the possibility could not be excluded that pigs and puppies, regarded as normal and healthy and employed for experiments on rickets, were suffering from latent rickets already before being subjected to experiment. —I am, etc.,

Aberdeen. J. P. MCGOWAN.

REFERENCES

Chick *et al.* (1938). *Biochem. J.*, **32**, 10.
McGowan (1933). *British Medical Journal*. **2**, 599.
—— (1938). Ibid., **1**, 917.
—— (1939a). Ibid., **1**, 297.
—— (1939b). *Nature*, **144**, 244.
—— (1940). *Edinb. med. J.*, **47**, 204, 425.
—— (1941). *British Medical Journal*, **1**, 172.
—— (1942). *Edinb. med. J.*, **49**, 568.
Wintrobe *et al.* (1940). *Johns Hopk. Hosp. Bull.*, **67**, 381.
—— —— (1942). Ibid., **71**, 141.

Treatment of Chronic Nephritis by Serum Transfusion

SIR,—The importance of serum transfusions in shock and haemorrhage has been well established. In chronic nephritis—or "nephrosis," a word I prefer to indicate this pathological condition—we have to deal with a leak of protein through the damaged kidney. In these cases we restrict the protein intake, but forget that protein can still be obtained from and at the expense of the body cells; in this way we increase the oedema.

Clearly, therefore, the method of treatment for this apparently hopeless condition is to give repeated transfusions of human or bovine serum intravenously or, in children, into the bone marrow of the tibia. I would like to stress the last point, as so often futile attempts are made to find a suitable vein in infants.—I am, etc.,

Southport. JOHN H. HANNAN.

*** In the *Journal* of April 25, 1942, we published a paper by H. Brown, C. H. Gray, and P. L. Mollison entitled "Treatment of the Nephrotic Syndrome with Serum Transfusions." The authors concluded that "in the nephrotic stage of glomerulonephritis a transfusion of concentrated serum is as likely to be followed by an adverse as by a favourable effect." —ED., *B.M.J.*

Malaria in British Troops in West Africa

SIR,—I read the article on this subject by Capt. S. B. Hughes and Lieut.-Col. R. R. Bomford (Jan. 15, p. 69) with great interest and appreciation, and feel that they have done a service in emphasizing the importance of recognizing the milder clinical types of the disease.

From experience on a smaller scale in another part of "the Coast," I feel the correct emphasis in teaching should be on the protean milder manifestations of the disease. How well I remember a number of cases originally treated, while relatively afebrile and in the absence of positive blood findings, as bronchitis or rheumatism, but which were later diagnosed as subtertian malaria! A common experience was to find the malarial symptoms masked by exacerbation of chronic disease, such as tonsillitis. While no experienced practitioner in the Tropics would overlook malaria in such a case, it is possible

that many potentially dangerous attacks of subtertian malaria masked in this way may go untreated in Service personnel returned to the United Kingdom. If no malaria parasites can be found in the blood films, an unusually high B.S.R. with increased monocyte count is often a guide.

With regard to the various clinical types not repeating themselves in the same individual, I can recall one patient each of whose three attacks took the form of very severe gastro-enteritis, but he may have been an exception. But it was noticeable that a series of cases occurring within a few days would conform to the same clinical pattern. This is possibly due to infection by the same mosquito, and consequently the same strain of parasite.

"Malaria-conscious" officers and N.C.O.s make prevention much more efficient, but strict disciplinary measures appear to be necessary, even now, to enforce the wearing of antimosquito clothing by all.—I am, etc.,

J. SANDILANDS,
Temp. Surg. Lieut.-Cmdr., R.N.V.R.

Population Problems of India

SIR,—The recommendations of the Hot Springs Conference are important, because they are the only concrete plans for real improvement of the standard of living throughout the world that have been proposed up to now. The difficulties involved therefore deserve careful consideration. I do not think that your correspondents have answered Prof. Blacklock's article. The food supply of India cannot be considered solely in terms of calories. The standard of diet proposed by the Hot Springs Conference involves a change from a diet that is largely cereal to one in which some 70% of the calories are derived from other foodstuffs. An acre of land producing these foodstuffs yields far fewer calories than when it produces cereals. That is why the diet at present is so largely cereal. It is true that a change to mixed farming, irrigation, the use of fertilizers, etc., would increase the fertility of the soil. It is not possible to work out exactly the possible yields in terms of calories or any other nutrient. But undoubtedly India could not supply a population much larger than at present with a satisfactory diet.

Comparison with Britain is invalid. Britain is, so to speak, an industrial town dependent on agricultural areas abroad. It is not possible for every country in the world to produce only two-thirds (or, as now, one-third) of its food. And even in Britain more of the foods that give a low yield per acre are needed in order to bring the average consumption to a satisfactory level.

The danger is that with an improvement in the standard of living and consequent fall in the death rate the food supply will never catch up with the population. This problem may not be insoluble, but it does exist; the people of India must find their solution. This is only one of the difficulties which are raised by the proposals of the Hot Springs Conference; another is the conflict between the demand for national sovereignty and the need to co-ordinate purchasing power and food production throughout the world.

I hope that no one will infer that I am anything but enthusiastically in favour of the Hot Springs programme; or that I regard famine and war as "Nature's pruning hook"; or that I want to maintain our standard of food at the expense of other peoples; or that I wish to dictate the reproductive habits of the people of India. But we have had one lesson in the consequences of promises made without thought of the difficulties involved in their fulfilment; I do not want to see another.—I am, etc.,

The London Hospital, E.1. JOHN MARRACK.

SIR,—It is to be hoped that Prof. Blacklock's soberly objective article on the population problem of India will not be allowed to become buried under a storm of abuse actuated by political or religious motives.

Experts differ as to the potential wealth of India, but even if the most optimistic estimate be accepted, the development of these potential resources must surely *precede* the increase in population they are expected to support. Since the reverse has been allowed to happen (present birth rate 34, death rate 22 per 1,000) it is not surprising that famine conditions are endemic in the country. The whole process is a pitifully wasteful one. It would seem not unreasonable to suggest that each medical centre (aimed at reducing the death rate) should include a birth control clinic, though admittedly their chances of success in either direction cannot be spectacular while the population remains largely illiterate (73% in 1941).—I am, etc.,

Leatherhead. M. GRACE EGGLETON.

Teaching of Anaesthetics

SIR,—While I am in agreement with many of the points raised by Dr. Lloyd-Williams (Dec. 25, p. 827) and Dr. Philip Ayre (Jan. 22, p. 127) as to the future teaching of anaesthesia, I would go further and suggest that practical instruction (as distinct from theoretical) for major operations should be abandoned altogether. A surgical dresser is taught how to deal with an acute abdomen, but is not expected immediately after qualification to operate on such a case, whereas it is more than possible that he will be asked to anaesthetize one. The essential point to my mind is whether the practice of anaesthesia is to be regarded as a specialty or not. If it is, it should be treated in the same way as all other specialized branches of medicine, and be confined to practitioners with special qualifications. Until the medical profession as a whole regards it in this light the present unsatisfactory position will continue. Surgeons themselves are partially responsible for the present anomalous state of affairs by permitting general practitioners to anaesthetize their own cases.

It may be said that there are not enough specialist anaesthetists to go round, but if a sharp distinction were made between anaesthetics for major and for minor operations, and only specialists allowed to handle the former, the minor cases could probably be safely dealt with by the newly qualified house officer and the general practitioner. If students could only be persuaded to forgo the glamour of the operating theatre and to attend dental out-patients and the casualty department, they would obtain a much sounder knowledge of the elements of anaesthesia. This should be supplemented by an adequate course of lectures, while the practical teaching of anaesthesia for major surgery should be entirely postgraduate.—I am, etc.,

London, W.1. MASSEY DAWKINS.

The Record in Urinary Calculi

SIR,—Mr. J. Armstrong's 58 urinary calculi make a very pretty picture, but I am afraid it is very far from being a record. In a paper published in 1934 (*Lancet*, July 28, p. 193) on "Stone in the Lower Urinary Tract in India" I gave details of a case in which I removed 635 stones from the bladder of a very ancient Hindu. The following is a cutting from a reprint of the article.

"*Case 1.*—This must be, I think, something of a record. An old man was admitted with some pain on micturition and slight pain in the lower abdomen. Palpation revealed a mass in the subumbilical region, tender on pressure. A sound could only be passed into the bladder with difficulty. Radioscopy showed a hazy, ill-defined shadow. On opening the bladder it was found to be absolutely full of small stones, the largest not being bigger than a small nut, and the greater number being the size of a small pea or less. The opening in the bladder was enlarged and the stones removed by the aid of a spoon. There were found to be 635 stones of all sizes. The bladder was entirely filled with them, and there could have been very little room for urine. How many years the old man had taken to accumulate such a vast quantity can only be left to the imagination. The bladder was closed in the usual way, and recovery was uneventful."

Whether this number constitutes a record I do not know, but it must be very near it. It is the equivalent of laying down a fresh stone every month for 53 years. Incredible as this may seem, it is even more astonishing that a man could exist for so many years in the discomfort which such a condition must have entailed without seeking advice. India is, however, full of such surprises. At the other end of the age incidence of urinary calculi, the youngest child from whom I removed a bladder stone was aged 6 months, the stone being the size of a hazel nut. This again is far from being a record, stones having been removed from babies as young as 3 weeks. The obvious inference is that they are sometimes laid down *in utero*.—I am, etc.,

Croydon. RUFUS C. THOMAS.

Treatment of Infective Hepatitis with Glucose, Insulin, and Ascorbic Acid

SIR,—One of the chief problems in dealing with cases of infective hepatitis in the Services is the time spent in hospital by patients suffering from this disease. So it was noted with great interest that MacDonald (Aug. 28, p. 261) claimed to have hastened recovery in cases treated by him with glucose, insulin, and ascorbic acid. In view of this it was considered justifiable to try a course of treatment consisting of 10 units of insulin twice a day, 25 mg. of vitamin C three times a day, and at least 5 oz. of glucose spread over the whole day. Ten patients were given this treatment and ten were treated as controls, all receiving a fat-free diet and sodium sulphate.

The duration of symptoms before admission was noted in each case, and the treatment was continued till the urine was free from bile; the total duration of the disease was calculated from the beginning of the first period to the end of the second. The total duration in those cases treated with insulin, vitamin C, and glucose was 10, 9, 10, 10, 13, 9, 9, 11, 17, and 14 days respectively, with an average of 11.2 days. The total duration in the other cases was 12, 11, 12, 18, 15, 18, 17, 7, 8, and 13 respectively, with an average of 13.1 days.

There is obviously no significant shortening of the duration of the disease by the insulin and vitamin C method of treatment, although the number of cases treated is small. It does not seem justifiable to use a treatment such as this unless its effects were profound, owing to the difficulty of obtaining insulin. On the other hand, it was noticed in cases so treated that they definitely improved subjectively at an earlier date than the controls, and suffered less from anorexia and nausea. This suggests that this treatment might be confined to those few cases in which the symptoms, especially vomiting, become severe and indicate a spread of liver damage. Differential blood counts were done on all these cases and showed without exception a relative increase in the lymphocytes.—I am, etc.,

N. S. GORDON,
Fl. Lieut., R.A.F.V.R.

School Medical Service

SIR,—In reply to Dr. Turner's letter (Jan. 29, p. 161), he will find that the section to which he refers—Section 122 of the Children's Act, 1908—was repealed in the Seventh Schedule to the Education Act, 1921, and its provisions were incorporated in the latter Act. This Act, in turn, will be repealed when the new one comes into force.

I would also like to draw the attention of medical officers to Clauses 31 and 32 of the Education Bill, where the words "serious" and "nature and extent" appear. From this it would seem that it is the intention that no children in the future shall be admitted to special schools unless the medical officers consider that their conditions are serious, and that medical officers making any such recommendations must be prepared to supply the parents and the education committee with certificates stating the nature and extent of the defects. Children requiring special-school education may be suffering from defects of the eyes, ears, lungs, or heart, or orthopaedic or mental conditions. Since doctors making recommendations for children's attendance at special schools may be called upon to give certificates stating the nature and extent of the defects, they would have to possess specialist knowledge in all branches of medicine and surgery in order to do so. As these certificates have only to be given when required, presumably they will only be asked for when objection is taken to the recommendations.

To demonstrate the awkward situation in which a doctor would be placed through it being made his duty to state in his certificate the nature of the defect, the imaginary example may be taken of a councillor's child suffering from seriously defective vision as a result of interstitial keratitis. The doctor would be forced to state in the certificate to be given to the parents and to the members of the education committee that the child's seriously defective vision was the result of congenital syphilis. In cases of paralysis it would be the doctor's legal obligation to give the extent of the paralysis by specifying the names of the particular muscles involved. If the words "nature and extent" are retained, too heavy a responsibility will be placed on school medical officers, and will result in large numbers of suitable cases not being recommended for special schools because the doctors consider it undesirable to disclose the nature, or feel that they have not the requisite specialized knowledge to state the extent, of the defect.

The open-air schools have in the past perhaps done as much valuable work as any of the special schools. As, however, the cases admitted to these schools cannot be classified as serious, it is presumed that under the new Act the intention is to abolish such schools.—I am, etc.,

Liverpool. R. GAMLIN.

*** We have received several other letters pointing out that Section 122 of the Children's Act, 1908, was repealed in the Education Act, 1921.—ED., *B.M.J.*

Shock Therapy

SIR,—I should be grateful if you would allow me to reply to the letters that have followed mine of Dec. 25. Most of these letters have been from psychiatrists, and this has disappointed me, since my aim was to sound the opinion of the profession as a whole. The general practitioner is probably too busy at present even to read letters, and yet I think his opinion on specialist practice should constantly be sought by specialists, if for no other reason than that the G.P. himself lives among his patients, among the therapeutic failures as well as among the successes.

I am well aware that a certain number of psychiatrists who are students of human nature are using various kinds of shock therapy as an adjunct to their psychotherapeutic work. These have nothing to fear from a letter from me to the medical press. They will continue their work, retaining, modifying, and discarding according to their careful observation of effects. Quite different from this is the idea which is developing that the treatment of mental disorder is shock treatment of one kind or another, and that this is something which can be ordered and given like chemotherapy in the case of septicaemia. No treatment of mental disorder will ever be invented which can be properly practised by anyone but a student of human nature. My letter has had some value in that it has produced an authoritative statement that shock therapy (of whatever kind) is not a treatment in itself. The opinion which I expressed—that shock therapy of mental disorder (even if it can be valuable in good hands) is a serious setback to the health of psychiatry—is strictly a personal one, and it is only fair to my psychoanalytic colleagues for me to make it clear that my letter expressed only my personal feeling.

Several of those whose letters were published assumed that I had psycho-analysis in my mind as an alternative to shock therapy. As a matter of fact I did not mention the word, though it is true that my training has been in the psychoanalytic discipline. The alternative which I am advocating is good general management, good personal doctoring and nursing, with toleration of therapeutic failure. This is extremely difficult to put into practice in the case of hopeless psychiatric material; but for every hopeless case there are hundreds, or rather thousands, of hopeful cases, and it is for them that we must plan psychiatric practice. This may sound surprising to some institution psychiatrists, but general practitioners will understand what I mean when I say this—that when medical science is able to control the physical part of certain common conditions, such as influenza, rheumatism, and high blood pressure, a great deal of serious depression, paranoia, and chronic hypomania will be revealed. This will have to be treated as 'flu and rheumatism and high blood pressure have always been treated—by personal doctoring and nursing. One of the really useful things the psychiatrists used to teach us was that depression phases tend to pass spontaneously with no more than an intelligent toleration of the condition on the part of those caring for the patient, watch being kept for suicidal attempts, deliberate or accidental. Freud made this teaching understandable by pointing out the relation of melancholia to normal mourning, which has its term and from which recovery can be expected. If the psychiatrists are really concerned to give help they can do so very much more than (with notable exceptions) they do now about occupation therapy. Perhaps the term "occupation therapy" is unfortunate, because it reminds one of the proverb about "idle hands," whereas a better term would indicate that what is wanted is a specialized form of

vocational guidance which gives subjective reality its proper place alongside the patient's relation to the external world.

One might have been content to let research into the value of shock therapy take its own course if it had not been for a certain communication which I received with regard to post-war planning. I was told that when peace comes an institution will be set aside for psychiatric illness in childhood, in which psychotic children will be treated by shock therapy. Just like that. Now my friend Dr. Rogerson may be gravely in error in thinking that psychosis in childhood is rare. In my opinion it is common. What schizophrenia and depression and paranoia and hypomania look like in childhood is a matter outside the scope of this letter, but the point is that the vast majority of cases recover spontaneously with right management, or, at any rate, manage to find some way of life which suits the type of personality. Those who use shock therapy in the treatment of adults generously admit that they have no idea how it works when it does work. I hoped by mobilizing general medical opinion to make it impossible in England for this research to be done on children.—I am, etc.,

London, W.1. D. W. WINNICOTT.

SIR,—There is nothing to be ashamed of in empirical medicine. But with the enormous strides in the scientific field it is inevitable that the sincere clinician must wish to know *how* he has attained results in his patients; it is not sufficient just to cure them. In other words, he must have some scientific framework of pathology or psychopathology within which to fit his clinical facts, and seek to explain any cure or attempt at cure with the language of his theory.

But let us remember that our psychopathology arose out of carefully observed clinical facts. In effect the critics of electric convulsant therapy are upset because they seek to cure with "love," and the exponents of E.C.T. are alleviating certain types of mental disorder with what appears to be "hate" methods. Each side is using the opposite antinomy of the original love-hate dualism. But do not Freudians get their results in depth analyses through the expression of the instinctual hate-impulses during the real negative (projection) transference phase?

Most of us can recollect some antisocial individual who has changed his ways without treatment of any specific kind through the effect on himself of another's example, so *shocking* that it had the effect of making him afraid of becoming likewise, and so hating his own way of life. If we don't like getting good or bad results without knowing sufficiently how these came about we shall, of course, criticize the same thing in others. The real danger we fear is (apart from inflicting actual physical lesions) lest any method becomes a "magic" to be used haphazard and carelessly in unsuitable cases.—I am, etc.,

London, N.W.8. J. C. MACKWOOD.

SIR,—Dr. Winnicott's letter on convulsion therapy has started a red herring which, so to speak, is careering across the psychiatric terrain with the hounds in full pursuit. Accordingly a good deal of speculative and irrelevant comment has been evoked to befog the issue.

Admittedly the treatment is purely empirical, has no rationale, and was based originally upon a misconception. It will consequently tend to disconcert and repel the scientifically trained mind. But clearly, as against this, first importance must be given to the fact that it works—it is often brilliantly effective—in a considerable proportion of cases. Does Dr. Winnicott seriously contend that in spite of successful results a treatment should be discarded if we do not know how it acts? This all-important question of results receives no mention in his letter. It is the theoretical aspect entirely that alarms him. The treatment, he thinks, is too violent (experience shows that it is not); the patient probably consents from an impulse akin to a suicidal one (this is not uncommon in other forms of treatment as well); it gives scope to the doctor's unconscious antagonism (does this not happen in psychotherapy too?); it offers a by-pass to true understanding of human nature (understanding is not enough without the power to alleviate). To bring in psychotherapy as the alternative is obviously irrelevant, as it is well known that the cases responding best to electrical convulsion treatment are as a rule unsuited for and inaccessible to analytical forms of psychotherapy.

In the evolution of medicine there is bound to be a place for the random discovery. After over 5 years' extensive trial of convulsion therapy one is surely compelled to emphasize how it has justified itself in the amount of suffering it has relieved, already very great. The attempt by theoretical objections to throw discredit upon a valuable form of treatment is likely only to result in discrediting those who make use of them. Their critical attitude is strangely reminiscent of the early opposition to psycho-analysis.—I am, etc.,

London, W.1. FREDERICK DILLON.

The Prisoner-of-War Mentality

SIR,—Nobody could regret more than I that my communication of Jan. 15 last should be depressing; we should thank Col. L. W. Harrison for trying to lighten the gloom. But in support of my previous statements I should like to refer him to Mr. Eden's comprehensive review on the matter in the House of Commons on Jan. 28. Commenting on communications received in this country from prisoners in Japanese hands, which universally suggest that the writers are being well cared for and are in good health, he says: "There is no doubt from what we know about particular areas that some of these communications at any rate are in terms dictated by the Japanese authorities"; and ". . . the true state of affairs is a very different one so far as the great majority of the prisoners in Japanese hands is concerned."

The point I wished to emphasize was that while we are indebted to Major P. H. Newman for correlating some material facts with psychological theory, we now have very many more, and awful, material facts on which we should have to base any future psychological treatment.

I am convinced that the Western mind has yet to grasp the Japanese mentality and its baneful influence. I would even go further and say that nothing, so far as I am aware, is being done officially or otherwise to enlighten our ignorance on the subject.—I am, etc.,

Petts Wood. B. RICHARDSON BILLINGS.

The Mosley Incident

SIR,—I do not intend to express an opinion one way or the other on the Mosley incident. But Sir Farquhar Buzzard's letter raises a most important point. He utters a protest—albeit rather a belated one—at the loss of professional secrecy which every patient should be able to claim as a right. I am afraid Sir Farquhar is a trifle behind the times. The average citizen has no such right to-day.

The bare expression of a medical attendant's opinion without a detailed statement as to what disease the patient is suffering from would not be sufficient to claim him exemption from fire watching, Civil Defence volunteer duty, or his wife exemption from forced service in a factory. On the contrary, the medical attendant has to allude to the disease—details of which must be submitted, and are scrutinized and even criticized by lay officials at Labour Exchanges. Suppose an unmarried mother were to make a statement to me as to her pregnancy, the bald statement "In my opinion her life would be endangered (or her health endangered) by her work in a factory or other form of National Service" would not be accepted by a National Service officer. On the contrary, such officials are encouraged by the Ministry of Labour to make searching inquiries into the actual disease or condition and its consequences. Further, they are even supplied with a glossary of medical terms to help them in their investigations. They frequently discuss the patient's health before a committee (composed of lay persons, and, in one instance known to me, such persons were neighbours of the unfortunate patient).

I once referred a patient back to the Labour Exchange because by virtue of brachial neuritis she was unable to work in a first-aid post. She was referred to a lay committee of the Labour Exchange, all of whom discussed her case openly, and one even went so far as to suggest that her past treatment had been useless! Another patient referred by a doctor for exemption on account of a major operation (hysterectomy) was told by a Labour Exchange official: "That oughtn't to take more than three weeks!" I may ask how much professional secrecy existed here.

I could supply many more instances, but perhaps the best of all is the following. A married woman who was pregnant brought in a certificate for exemption. Being nervous, she murmured the contents in a low voice, and was greeted by the woman official with these words: "Come on, now! Speak up! *What* is your condition?" Adding in a voice of thunder: "You're *pregnant*, aren't you?" The entire room could hear this effort. I trust Sir Farquhar would have voiced his indignation as I did. Certainly it would be in a worthier cause than that of Sir Oswald Mosley!—I am, etc.,

Ilford, Essex. ROGER M. NOORDIN.

SIR,—Sir Farquhar Buzzard must not be allowed to get away with that pontifical letter unchallenged. The *B.M.J.* is not a professorial chair. "The 'patient' in this case is a private citizen with a private citizen's rights, including that of entertaining his own political faith." What, even if it is the faith of the Germans; even if it delights in their bestial means—rubber bludgeonings, calculated brutality, inducement by fear; even if it seeks to stir up racial hates? Nonsense. The next sentence: "This country is at war with nations who contest that right and who do all in their power to suppress it, and it is largely to maintain what we believe to be an individual freedom of faith that we are fighting." Are we fighting to allow people to adopt the cruel and obtruding doctrine of Fascism? Nonsense, again. The herd was quite right in being sensitive to the release of the head of an organization whose associates are costing us an ocean of sweat, blood, and tears. The herd was obeying a sound instinct and arrived at sounder conclusions than those to which a restricted and juridical view—the typical professorial psychology—has brought Sir Farquhar. Can anyone doubt what part the "patient" would be playing if England were as Norway is? Sir Farquhar does not mention the wealth of the "patient," which had something to do with rousing the herd's suspicions. About the illness itself I am mystified. Is His Majesty's Prison Service unable adequately to look after a case of thrombosis? As for Sir Farquhar's suggested report—"In our opinion the health and perhaps the life of Sir Oswald Mosley will be endangered by his further detention"—that might truthfully refer to a cold or a corn.—I am, etc.,

Beckley, Sussex. C. G. LEAROYD.

SIR,—In your issue of Jan. 29 I observed a letter from Sir Farquhar Buzzard. It is surprising, this criticism by so eminent a member of the profession. He refers to that section of the public who protested against the release of Mosley as "illogical, indefensible," and he further refers to the "hysterical Press and ignorant and foolish questions in the House of Commons"—a rather sweeping condemnation of these great institutions. This attitude throws a doubt on his own logic. No one would question the right to medical advice in a case of this kind, but this arrogant renegade, owing to his wealth, is able to obtain the services of very eminent members of the profession to press his claims for release. Public opinion—I would also refer to the non-vocal section—was very much on the side of the "hysterical Press and ignorant House of Commons," and this reviving of an unpleasant episode would have been better left alone.—I am, etc.,

Southborne-on-Sea. E. A. CHARTRES.

SIR,—Sir Farquhar Buzzard agrees that owing to the war "it became necessary to prevent the patient [Sir Oswald Mosley] from actively spreading his gospel." It is precisely anxiety on this point that led large and responsible sections of the public to protest against the release, at a critical phase of the war, of Britain's former Fascist leader and his wife. They were anxious lest this action would encourage and even facilitate the spread of propaganda detrimental to unity within the nation and between us and our Allies, and lest it would weaken the national effort and the morale of the troops. Their protests certainly did not reflect, as Sir Farquhar suggests, the desire for Mosley's personal suffering or even his death. It should be recalled that those who protested included the principal trade unions, deeply involved in the war effort. Yet they are dubbed by Sir Farquhar as confused, actuated by "herd psychology," acting illogically and indefensibly, and as displaying lamentable ignorance; while the Press is accused of publishing uninformed and hysterical criticism, and M.P.s of asking ignorant and foolish questions. Such a diatribe against the British public for democratically expressing their opinion in the ways open to them on a matter which they believed affected their country's security seems inconsistent with Sir Farquhar's plea for tolerance of individual freedom of faith. Indeed, he has misunderstood the spontaneous and widespread hostile reaction to Mosley's release. It is, surely, a healthy sign that ordinary men and women are so much awake to the dangers of the doctrine which led to Mosley's detention, for it is the very embodiment of this doctrine of Fascism which we are aiming to destroy utterly abroad.—I am, etc.,

London, N.W.1. P. D'ARCY HART.

Plastics in Splint-making

SIR,—I read with interest Mr. James P. Campbell's note in the *Journal* of Jan. 29, and should like to comment on some of his statements.

Mr. Campbell says the manufacture of such a splint is in an experimental stage, presumably because he has only recently started to use them. I have made splints and other appliances in "perspex" for at least six years, and discovering very few surgeons who knew about the possibilities of this material I wrote a short introductory article on the plastic splint (*Lancet*, June 26, 1943, p. 803). These splints have been satisfactory for many purposes, and I can assure Mr. Campbell that not only is "perspex" non-irritant to the skin but is tolerated by any tissue. We all know "nylon" and "portex," used in sutures and dentures respectively; "perspex" has the same property of lying inert in the tissues, permitting its use as bone plates and in arthroplastics.

Mr. Campbell has also underestimated the strength of "perspex" in using 3/16-in. sheet. He will find 1/16-in. sheet adequate, with the great advantage that it can be cut with ordinary scissors after preliminary local heating over a small flame. His splint for a wrist will then weigh 3 oz. instead of 9 oz., and be infinitely easier to shape into greater accuracy. Another point which might be mentioned is the property of non-absorption. This is a valuable quality in some circumstances, but where the splint is complete and not just a slab, condensation of moisture is troublesome. The splint will then require holes drilled at intervals or a lining of thin felt.

Lately many people have written to me saying they have had difficulty in moulding splints where there are double curvatures. I hope there will soon be on the market suitable splints preformed as regards the main curves, and requiring only local moulding and fitting, thus ensuring a well-fitting splint of even thickness. Another aid to such work is a softener, which allows the treated "perspex" to be moulded in a plastic state, hardening twelve hours later; no heat is required. Leather retaining straps rather detract from the unique appearance of these splints, and I suggest that they should be replaced by transparent flexible plastic strips. Mr. Campbell says cracks cannot be repaired by heat. He will find that any cracked pieces can be "welded" by allowing glacial acetic acid to run in by capillary attraction. The acid dissolves the "perspex," allowing the edges to join together.—I am, etc.,

A. MACGOWAN.

Photomicrography with Ordinary Cameras

SIR,—I am glad that Dr. Silcock (Jan. 29, p. 164) has added his testimony to the value of the method of photomicrography I described, and I must also congratulate him on being apparently the first to publish any account of the method, for during an avid reading of photographical and microscopical literature during thirty years I have never seen it described, and the textbooks know nothing of it. I may perhaps say that an earlier paper of mine describing the method specially for Leica users would have appeared in *Leica News*, but the war prevented publication, and a similar fate befell a more general account in 1942. Now that attention has been drawn to the method I trust that it will be widely adopted. Its value in industry is obvious.

It is important to realize that the method is applicable to all types of optical apparatus, and that for photomicrography at least it is not just a makeshift but scientifically the most correct way of taking a photograph. If the camera used had

a 10-in. lens it would give photographs identical with that seen by the human eye, and at least as good as those taken by the most elaborate photomicrographical apparatus. It would indeed make the latter as obsolete as the huge contraptions with which the pioneers of ordinary photography did their excellent work.

It is also necessary to emphasize that the simple method described by Dr. Silcock will not give good results unless the viewing eye is emmetropic. If this is not so, either a camera with focusing screen must be used or, much simpler, a gadget like I described if the correct focus is to be obtained. Actually this is not so critical as one might anticipate, as the microscope never works at a greater aperture than F. 22, and probably for this reason I find that photomicrographs taken with a 2-in. lens show appreciably greater depth of focus than my eye has.—I am, etc.,

Winsford. W. N. LEAK.

Obituary

JOHN S. FAIRBAIRN, F.R.C.P., F.R.C.S., F.R.C.O.G.

Dr. John S. Fairbairn, who died on Jan. 22, lived his professional life in London but never lost touch with Scotland, and went to live there when he retired from practice eight years ago.

John Shields Fairbairn was born on Dec. 21, 1865, at Bathgate, West Lothian, the elder son of Andrew Martin Fairbairn, D.D., first Principal of Mansfield College, Oxford. From Bradford Grammar School he entered Magdalen College, Oxford, with an open science demyship, and in 1891 gained first-class honours in the School of Natural Science; he went to St. Thomas's Hospital for his clinical course, and graduated B.M., B.Ch. in 1897, after taking the English Conjoint Diplomas. He obtained the F.R.C.S.Eng. in 1900, and in 1909 was elected F.R.C.P.Lond. Dedicating himself early to the practice of gynaecology and obstetrics Fairbairn became in turn pathologist to the Chelsea Hospital for Women, physician to the General Lying-in Hospital, York Road, and obstetric physician and lecturer in midwifery and diseases of women at St. Thomas's. At the Royal College of Physicians he served as examiner for four years, councillor for two years, and Bradshaw Lecturer in 1934, when his subject was the medical and psychological aspects of gynaecology; he also examined for the Universities of Oxford, Cambridge, Glasgow, London, Birmingham, and Leeds, and for the Society of Apothecaries of London. During the last war he served on the *à la suite* staff of the 5th London General Hospital with the rank of captain, R.A.M.C.(T.). He was one of the Foundation Fellows of the Royal College of Obstetricians and Gynaecologists in 1929 (and afterwards held office as President), and in the same year was elected Honorary Master of Midwifery by the Society of Apothecaries; the Obstetrical Society of Edinburgh made him an Honorary Fellow.

Fairbairn joined the B.M.A. in 1903, was secretary of the Section of Obstetrics and Gynaecology in the following year, and twice held office as president of that Section—in 1924 at Bradford and in 1935 at Melbourne, whose university gave him the honorary degree of M.D. on that occasion. He had been a frequent contributor to this and other medical journals; he edited for some time the *Journal of Obstetrics and Gynaecology of the British Empire*, and was the author of *Gynaecology with Obstetrics* and of a *Textbook for Midwives*; he was also editor of the *Practitioner's Encyclopaedia of Midwifery and Diseases of Women*. He preceded Sir Comyns Berkeley as chairman of the Central Midwives Board for England and Wales. In March, 1936, just before they left London, Dr. and Mrs. Fairbairn were entertained to dinner in the Langham Hotel, and over 100 guests were present under the chairmanship of Sir Ewen Maclean, who eulogized Fairbairn's work in furtherance of the teaching and practice of midwifery throughout Britain. At Lossiemouth, where he had spent many summer holidays, he was able in retirement to indulge his hobbies of golf and gardening.

We are indebted to Dr. J. P. HEDLEY for the following appreciation:

The death of John Fairbairn at Lossiemouth came as a great shock to his many friends, and perhaps especially so because few of us had been able to see him on account of the war during the last four years. In peacetime he came to London for several weeks each year to see his friends and enjoy moving about in the old surroundings in which he was always so happy.

He came up to St. Thomas's in 1893 from Oxford, where he had taken a first class in the honours school of Natural Science; after qualifying at Oxford he was house-physician and obstetric house-physician before becoming obstetric tutor and registrar in 1898. Four years later he was appointed to the staff of St. Thomas's as assistant obstetric physician. His father, the Rev. Dr. A. M. Fairbairn, the first Principal of Mansfield College, Oxford, was a distinguished scholar, and it may have been from him that he inherited his devotion to education. Fairbairn was an enthusiastic teacher at the time when I first met him as obstetric tutor; later as a clinical teacher he was quite exceptional. For years generations of St. Thomas's men looked upon him as a great teacher, and very many have reason to be grateful for what he taught them. Fairbairn had original ideas in the organization of a complete obstetric service, and did more than anybody to plan and put into force the modern methods of education needed for such a service. He always made a great point of the indivisibleness of obstetrics and gynaecology and accentuated this point in the title of his well-known book *Gynaecology with Obstetrics*. He taught that obstetrics was one of the most important parts of preventive medicine, and in his book he says: "At no stage in his hospital career can the student obtain a clearer object-lesson in the practice of preventive medicine than while studying obstetrics, gynaecology, and paediatrics: together they form a concrete example of the direct application of the teaching, otherwise wholly academic, in hygiene and public health." He always stressed the greater importance of training than of examinations.

At the Society of Apothecaries he was largely responsible for the institution of the Mastership of Midwifery, the first higher diploma in obstetrics in the country, in which all candidates had to have postgraduate experience in obstetrics, paediatrics, and public health, including a resident house appointment in an obstetric unit. Later, when the College of Obstetricians and Gynaecologists was founded—of which Fairbairn was the second President—similar training regulations were made. He was a very active member of the Central Midwives Board, both before and after becoming its chairman. He was just as keen on the education and training of midwives as of doctors. In connexion with the General Lying-in Hospital he conceived and brought into being the Camberwell Post-Certificate School, to which midwives came for refresher courses; this proved a great success, and has been the model for other schools spread over the country.

Although Fairbairn's greatest work was educational, there was no member of the St. Thomas's staff who was more conscientious and thorough in all his hospital duties and the care of his patients. His interest in hospital affairs was not confined to his own department: he was always ready to work for any new development he thought to be good. The loss of him to medicine is great, but fortunately he has left much in his writings that will be a guide and help to many in the future.

A. STEWART WILSON, F.R.C.S.ED.

We have received news of the death on Nov. 2 at his home in Durban of Dr. A. Stewart Wilson. He had been ill for the last two years.

Alex. Stewart Wilson qualified M.B., Ch.B. at Glasgow in 1911, and took the F.R.C.S.Ed. in 1918. When the Royal College of Obstetricians and Gynaecologists was formed in England he was one of the very few South African doctors whom the College elected to foundation fellowships. After holding resident appointments in the Western Infirmary, Glasgow, he went to South Africa in 1913 and joined the staff of Addington Hospital, with which he was associated throughout his life as resident medical officer, senior visiting gynaecologist, and chairman of the medical staff committee. During the last war he served in France and at the South African Military Hospital, Richmond. Returning to South Africa after the war, Stewart Wilson began practice as a consultant gynaecologist in Durban, and rapidly became the leading member of his specialty in Natal. He was a member of the South African Medical Association (B.M.A.), and was president of the Natal

Coastal Branch and chairman of the Gynaecological Section at one of the annual meetings. He took a keen interest in the Berea Nursing Home, having been chairman of its board of directors and been largely responsible for its expansion and development. He was a brilliant operator, an original thinker, and a man of sound judgment. At the hospital there was keen competition to act as his resident, and many young doctors have expressed appreciation of his skilful teaching and kindly encouragement.

Among his varied interests outside his work were several branches of sport—he was a liberal patron of many of the sporting societies of the town—the British Empire Service League, a number of charitable institutions to which he contributed generously throughout his life, and the welfare of nurses—the training school for midwives was started through his efforts. A loyal and trusted friend, he will be sadly missed by his patients and by friends inside and outside the profession. He is survived by his wife and daughter, by whom he was devotedly nursed during his long illness.

THE LATE DR. G. C. ANDERSON

Viscount Dawson of Penn as President of the British Medical Association has received from Sir Alfred Webb-Johnson, President of the Royal College of Surgeons of England, a copy of the following resolution, unanimously adopted by the Council of the College at its last quarterly meeting: "The President and Council of the Royal College of Surgeons of England hereby express their deep regret at the death of Dr. George Cranston Anderson and their sympathy with the British Medical Association in the loss of their Secretary. The Council desire to place on record their admiration for Dr. Anderson's able services to the profession, particularly in regard to recruitment for the Services, and their appreciation of his success in bringing about a closer friendship between the College and the British Medical Association."

A copy has been received from the Royal College of Obstetricians and Gynaecologists of the following resolution passed at its last quarterly meeting: "That the profound sympathy of the President and Council be tendered to the British Medical Association in the great loss sustained by the death of Dr. G. C. Anderson."

Further messages of sympathy on the occasion of the death of Dr. Anderson have been received from the New Zealand Branch (by cable), from the National Temperance League, and from the Surgical Instrument Manufacturers' Association.

The death on active service of Fl. Lieut. C. F. H. WIESSNER was briefly announced in our issue of Jan. 1 (p. 28). Charles Frank Horace Wiessner was born in 1912. He studied medicine at Cambridge and the Middlesex Hospital, qualifying M.R.C.S., L.R.C.P. in 1938, and M.B., B.Ch. in 1940. He was for a short period in general practice in South-East London until appointed to a commission in the Medical Branch of the Royal Air Force Volunteer Reserve on March 21, 1941. At the date of his death he was medical officer at an Air Training School over-seas.

The death has occurred at Grimston, Norfolk, of Dr. CHARLES STUART WOODWARK, J.P., aged 66, fourth son of the late George Woodwark, a prominent citizen of King's Lynn about the turn of last century. Dr. Woodwark was a younger brother of the late Lieut.-Col. G. G. Woodwark, M.P., and of Sir Stanley Woodwark. He was educated at St. Bartholomew's Hospital, whence he qualified in 1902. Some years ago a breakdown in health necessitated his retirement from practice, and lately an even more serious malady developed and caused his death. He was in general practice at Grimston for the whole of his active career, and his high reputation in the neighbourhood was shown by the addition of his name to the Commission of the Peace. A member of the B.M.A., he was chairman of the West Norfolk Division in 1922. He married Miss Winifred Hill, who survives him with their three sons and two daughters, all of whom are in the Services; one son is a squadron leader in the R.A.F., and another is a prisoner of war.

We regret to record the death on Jan. 14 at King's Langley of Dr. ELIZABETH THACKRAY. After qualifying M.B., B.S. in 1903 from the London School of Medicine for Women and the Royal Free Hospital, Dr. Hill (as she then was) held the post of house-surgeon to Sir James Berry at the Royal Free Hospital. She was next appointed assistant medical officer to St. Pancras Infirmary, resigning that position on her marriage to Dr. Christopher Thackray, the medical superintendent. She resumed medical work during the last war, returning for part of the time to her post at the Infirmary, while later she was a medical examiner of recruits for the W.A.A.C. She retired finally from practice in 1918. Dr. Thackray had great personal charm, which endeared her to all her colleagues.

Dr. FRANCIS WILLIAM JOLLYE died suddenly on Jan. 14 at Alresford, Hants, aged 80. He was a native of Spalding, Lincs, and left Cranbrook School in Kent to study medicine at King's College Hospital, winning the Warneford entrance scholarship in 1882 and other scholarships in successive years. He qualified M.R.C.S. and L.S.A. in 1885, took the D.P.H. in 1890, the F.R.C.S.Ed. in 1897, and the M.D. of Durham University in 1903. Settling in practice at Alresford he became M.O.H. under the rural district council, and held other local appointments. Dr. Jollye was a Fellow of the Society of Medical Officers of Health, joined the British Medical Association in 1891, and was president of the Southern Branch in 1913. A number of papers by him on clinical subjects appeared in these columns during the 'nineties. He retired from practice in 1937.

Dr. PURNELL PURNELL, whose death took place on Jan. 22 at Streatham, was the son of J. J. Purnell, F.R.C.S., and was educated at Epsom College and at Guy's Hospital. He qualified M.R.C.S., L.R.C.P. in 1889, and practised for very many years at Streatham. His chief claim to the grateful recollection of his professional colleagues lies in his unwearied efforts on behalf of the Royal Medical Foundation of Epsom College, in recognition of which he was some years ago elected a vice-president. He collected for the Foundation in all not far short of £3,000, a total which has been but once, or possibly twice, exceeded by any individual member of the profession. He married Miss Ivy Florence Goldsmid.

The death occurred at his daughter's house at Gwelo, S. Rhodesia, of THOMAS OVENS SCOTT at the age of 81 years. The eldest son of the head master of the Academy of Berwick-on-Tweed, he took the M.A. of Edinburgh in 1882, and entered the Presbyterian Church. While holding a pastorate at Newcastle-upon-Tyne he studied medicine, and graduated M.B., B.S. at Durham in 1897. After seven years, during which time he was appointed honorary surgeon to the Throat and Ear Hospital, Newcastle-upon-Tyne, he moved to Leeds, where he remained in general practice till 1934. Quiet and unassuming, and unselfish in his true Christian humility and sympathy, yet staunch and unchanging in his faith, Dr. Scott was a tower of strength in time of need. To all his many friends he has left memories, and all of them pleasant—a rich legacy. At the end of a vigorous healthy life he died peacefully in his sleep—a man without envy and without enemies. He leaves a daughter and three sons, two of whom are doctors—one at Sunbury-on-Thames and one in Leeds.

Mr. W. McAdam Eccles writes: May I emphasize two points in memory of the late Dr. C. E. DOUGLAS. One his great keenness on all matters concerning the B.M.A., shown especially during the World Tour of 1935. Dressed as the "Oldest Inhabitant" on the occasion of a fancy dress parade, he was awarded the first prize, but did not show signs of "old age"! To signalize permanently the chess-playing during the trip he presented the "Melbourne Chess Cup" to the B.M.A., to be competed for annually and presented at the meeting of the Representative Body to the winner, to be held for twelve months.

The ashes of the late Mr. CECIL ROWNTREE, F.R.C.S., were scattered on Jan. 27 at a brief ceremony, the first of its kind in the history of the hospital, on the spacious lawn in front of the Woolwich Memorial Hospital, Shooters Hill. Those present were Mr. Tom Rowntree, F.R.C.S. (son), Air Commodore E. G. Dixon (chairman of the hospital), Mr. E. T. C. Milligan, F.R.C.S. (chairman of the medical committee), Mr. A. W. Lincoln Bell, F.R.C.S. (resident surgical registrar), and Miss C. E. Lotherington (matron). The chairman of the hospital, in paying tribute to Mr. Rowntree, referred to the affection and respect in which he was held. He had helped to design the hospital and was its first surgeon. He placed his exceptional surgical skill and advice ungrudgingly at the disposal of the public of Woolwich, the board of management, and the medical and nursing staffs. He would ever be remembered as an inspiration to the staff and with gratitude by those who benefited by his surgery. To his wife and family he offered, on behalf of the hospital, deepest sympathy. Mr. Milligan, who performed the ceremony, said that Mr. Rowntree was essentially a happy man, animated by an ardent desire for hospital efficiency through unity between surgeon and surgeon, and between the medical committee and the board of management. In this he showed himself to be a true statesman, for he saw that such unity based on good will was the secret of sound homes, team-work in industry, and a united nation.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a Congregation held on Feb. 21 the following degrees were conferred:

M.B., B.CHIR.—D. Ainslie, F. Ashton, V. L. Billington, A. Carpenter, R. P. Cook, F. H. Epstein, W. G. Evans, A. H. M. Fisher, W. M. Foreman, J. A. Hallinan, R. F. Hobson, R. G. F. Parker, T. J. Rendle-Short, L. A. Rook, L. J. Rowley, I. A. Roxburgh, F. A. R. St. John, D. H. K. Soltau, P. G. Somerville, R. G. Tasker.

[1] In person.

UNIVERSITY OF LONDON

WESTMINSTER HOSPITAL MEDICAL SCHOOL

An examination for two entrance scholarships in anatomy and physiology will be held on March 15 and 16. For further particulars application should be made not later than Feb. 21 to the Secretary, Westminster Hospital Medical School, 17, Horseferry Road, S.W.1.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly Comitia of the College held on Jan. 27, with the President, Lord Moran, in the chair, the following were elected Representatives of the College: Dr. B. T. Parsons-Smith on the Council of the Queen's Institute of District Nursing; Dr. A. S. Barnes on the Court of Governors of the University of Birmingham. It was announced that the President was nominating a committee to preside over the work of revision of the College's publication on *The Nomenclature of Diseases*. It was also announced that arrangements have been made for examinations for the Membership of the College to be held in Poona and in Cairo during May and June, 1944.

The following candidates, having satisfied the Censors' Board, were elected Members of the College:

C. R. Amies, M.D.Lond., J. Benn, M.B.Leeds, Surg. Lieut.-Cmdr., R.N., Mary E. Eiloart, M.B.Lond., J. A. Fisher, M.D.Belfast, J. H. Gould, M.B. Lond., E. Gutmann, M.D.Munich, D. B. Jelliffe, M.B.Lond., T. D. Kellock, M.B.Camb., Zina E. Moncrieff, M.B.Aberd., R. T. C. Pratt, B.M.Oxon., J. C. Prestwich, B.M.Oxon., D. W. Pugh, D.S.C., M.B.Lond., Surg. Lieut. R.N.V.R., H. W. Salmon, M.B.Lond., H. T. N. Sears, M.B.Lond., J. Sharkey, M.B.Lond., A. I. Spriggs, B.M.Oxon., A. W. Taylor, M.B. Leeds, J. P. M. Tizard, B.M.Oxon., Capt. R.A.M.C., M. D. Young, M.B. Camb.

Licences to practise were granted to the following 133 candidates (including 23 women) who had passed the Final Examinations in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the necessary by-laws:

J. Alterman, C. van C. Anthony, C. G. Ball, G. H. Bancroft-Livingston, R. E. G. Barnes, J. H. E. Bergin, V. H. Bolton, J. A. P. Bowen, T. J. Brady, Elizabeth T. Brash, L. L. Bromley, H. D. Browne, J. Bullough, K. H. Bywater, A. S. Carruthers, J. A. Clarke, I. R. Clout H. M. T. Coles, J. R. C. Cooper, Margot J. Copland, J. A. N. Corsellis, T. C. Cotton, G. S. Crockett, J. S. Crowther, G. A. N. Davis, Deborah Doniach, Kathleen A. D. Drury, D. R. Duff, Margaret J. Dunn, R. Earl, P. M. Edis, A. W. Edridge, Olga M. Elliot, A. B. A. Evans, M. E. Evans, J. M. Fabricius, Winifred J. Ferraby, V. O. Finlayson, J. R. Forsaith, I. H. Fothergill, S. A. M. Garibian, B. Haigh, L. H. Hamlyn, R. J. Harrison, G. Hartdridge, Ruth M. Haslam, V. S. Hawkes, S. F. Hewetson, H. F. Hills, Dulcie E. Holden, F. L. Holroyd, J. E. G. Hope Scott, W. R. Humphry, R. W. L. Hurt, Lois E. Hurter J. R. Hutchinson, P. E. Jackson, Rosemary Jackson, C. D. T. James, L. F. Jepson, O. G. Jones, Jean L. Kahan, D. E. R. Kelsey, J. C. Lawrie, G. de J. Lee, Sheila D. Lee, A. V. Livingstone, P. S. London, J. Lorber, P. F. Lucas, M. B. McIlroy, A. G. Mackenzie, I. M. MacLean, N. L. M. MacManus, R. Majdalany, A. S. Mallam, J. M. Mallet, J. T. Marcroft, J. K. Morgan, Catherine A. Neill, D. C. J. B. Nixon, A. W. Nurick, A. C. F. Ogilvie, D. H. D. Paine, C. R. Palmer, T. J. S. Patterson, B. W. T. Pender, C. P. Perkins, Dorothy M. Phillips, Mary Pilling, W. E. Prosser, T. A. Quiliam, J. V. Radley, D. H. Rea, D. L. Rees, L. J. Rowley, Helen M. Russell, J. T. Scales, C. L. E. H. Sharp, Edith M. Sharpe, G. N. Shell, L. Shenfield, P. D. W. Shepherd, R. N. Sidebotham, B. C. Smith, Y. G. Sofer, P. G. Somerville, R. Spielsinger, R. V. Sturton, S. M. Talaat, A. Taylor, E. H. Taylor, C. G. Teverson, J. M. Thomas, W. E. W. Tilleke, Margaret R. Todd, L. J. Topham, E. J. S. Townsend, E. L. Trickey, G. Trosser, E. C. Turton, Ambrosine B. Vaughan, B. H. Vawdrey, P. Venables, C. I. Waters, T. K. Whitmore, Dorothy Willoughby, Joan B. Winstanley P. W. Woodcock.

Diplomas in (*a*) Public Health (2), (*b*) Psychological Medicine (8), and (*c*) Laryngology and Otology (5) were granted to the successful candidates whose names were printed in the report of the meeting of the Royal College of Surgeons of England in the *Journal* of Jan. 22 (p. 134). Diplomas in Anaesthetics (27) were granted to those whose names appear in the report of the meeting published in the *Journal* of Dec. 25, 1943 (p. 835).

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting held on Feb. 1, with the President, Dr. A. Fergus Hewat, in the chair, Dr. Donald Stewart (Birmingham) and Dr. Alexander Brown (Edinburgh) were introduced and took their seat as Fellows of the College. Dr. Duncan Macmillan (Nottingham), Dr. Richard Edward Verney (Edinburgh), and Dr. Joshua James Morris Jacobs (London) were elected Fellows. Mr. Norman M. Dott, F.R.C.S.Ed., was appointed Morison Lecturer for 1944. Dr. A. Rae Gilchrist, F.R.C.P.Ed., was appointed George Alexander Gibson Lecturer for 1944.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a quarterly meeting of the Council held on Jan. 29, with the President, Mr. Eardley Holland, in the chair, the following candidates were elected to the Membership: A. P. Bentall, Jean R. Burton-Brown, Agnes E. Cathcart, Audrey I. Freeth, D. Friedlander, M. M. Garrey, Eileen D. M. Wilson.

The Council passed a resolution of sympathy with the British Medical Association on the death of their Secretary, Dr. G. C. Anderson. The President was appointed to serve *ex officio* as a member of the Committee of Management of the Royal Medical Benevolent Fund.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been granted the diploma of L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P.&S. Glas.:

J. M. Allan, S. Batkin, H. D. Bauer, L. Beukes, H. Binysh, F. G. Brindley, H. S. Dougall, N. R. Eaton, A. S. W. Egerton, Jeanette R. B. Gibson, J. A. Love, C. K. MacKinnon, D. S. Mathers, W. Y. Muir, D. R. O'Keefe, J. A. Orr, P. C. C. Petters, G. L. Plester, S. M. O. Price, A. R. Ray, S. L. Schwarzwald, J. D. Scobie, J. S. M. Sililo, A. S. Smith, M. Spence, J. S. Stevenson, J. A. Sykes, Ruth R. Turner, S. Walport, J. Wilson, W. H. A. Windress, J. A. Wright.

I. Lopertas, M. Rottenberg, and E. Stengel, graduates of recognized foreign universities, were also admitted licentiates.

Medical Notes in Parliament

Relief in Europe: Medical Problems

The House of Commons on Jan. 25 discussed the proposals for relief and rehabilitation of the areas in Europe as they are freed from enemy control. The debate arose on a vote of credit which included expenses for relief and rehabilitation, and Sir JOHN ANDERSON explained that the Government proposed that Great Britain should contribute 1% of the national income, which would amount in round figures to £80,000,000. Mr. GREENWOOD, speaking of the enormous problems which lay ahead, said that starvation was rampant over the greater part of occupied Europe to-day, and the situation would grow worse. Increasing debility, lowered resistance to disease, epidemics of typhus, and a growing amount of tuberculosis would become more dangerous because of the large-scale forced migration which had taken place. About 20,000,000 people had been driven from their homes and countries, and a great many of them had become disease carriers. It was important to know the organization of the personnel of U.N.R.R.A. Were the doctors ready? Were there specialists for the restoration of the sanitary services?

Dr. HADEN GUEST said that although the food situation in the Middle East and North Africa had much improved, that in Italy was different and more serious, and showed the difficulties with which we should be faced. There were great food difficulties although we were in control of the area, and a raging typhus epidemic, which was difficult to control but which, fortunately, had not spread to the Allied Forces. The situation in Italy was precisely the kind which would arise in other parts of Europe, and he urged that a White Paper, dealing with the experience of relief up to date, should be published. He hoped that the voluntary relief organizations would be given, under proper supervision and after proper selection, a rather freer hand than the present Command Paper suggested. Another matter of very great importance concerned medical staffs for this work. He did not know where medical staff was to be obtained. At present we could not recruit a very large number of people from this country for medical relief work on the Continent because they were not available, but a very large number would be required for the war in the Far East. There would always be some shortage of doctors from this country, but as soon as we had got into occupied Europe many doctors belonging to the countries there would be available to give us very considerable help, and no doubt they would be willing to co-operate. He did not think the doctor difficulty would be insuperable, and he believed we should be able to control epidemics, but he hoped that what was going on in Italy would lead to a little better organization than apparently existed.

Mr. LAW said that it was impossible to estimate what the demand for voluntary workers from this country would be. At the moment the Council of British Societies for Relief Abroad was making up teams to be held in reserve against any demand from U.N.R.R.A. Those teams would, he hoped, be highly qualified. For example, there was a water purifica-

tion unit, a bacteriological unit, a static disinfector unit, and so on. It was not going to be a sort of Continental holiday for young people from Mayfair. Extremely skilled and highly qualified people would be wanted to go out and assist in the relief work in Europe.

Army Doctors' Administrative Duties

On Jan. 25 Major CHARLES TAYLOR asked the Secretary of State for War how many members of the medical profession are employed in administrative posts in the Army or on other duties which did not involve the use of their medical skill; and, in view of the shortage of doctors, both in the Services and among the civil population, whether he would arrange for administrative posts in the R.A.M.C. to be filled by men who were not doctors. Sir JAMES GRIGG: If the question is taken literally, the answer is "None, sir"; but in view of the general shortage of doctors, a detailed investigation has been made of Army medical establishments at home and abroad. Wherever possible, officers without medical qualifications have replaced qualified medical officers employed on administrative duties, even in those posts where professional medical knowledge, although not essential, is very useful.

Major TAYLOR asked if there were not a number of cases of doctors who very rarely, if at all, used their medical skill, and who were doing purely administrative jobs in the R.A.M.C. Sir JAMES GRIGG said if Major Taylor meant purely routine administrative jobs, he imagined that the medical directors in command or in theatres of war abroad would have to be doctors, because their medical knowledge was essential for the proper administration of the medical service.

Catarrhal Jaundice

Mr. SORENSEN asked on Jan. 27 whether the Minister of Health could state the extent of the outbreak of catarrhal jaundice and to what cause or causes it was attributed. Mr. WILLINK said catarrhal jaundice was not a generally notifiable disease, although for research purposes it was recently made notifiable in certain eastern counties. He had, therefore, no definite information about its incidence. It had latterly become prevalent throughout Europe and in North Africa as well as in this country. Its causes had not been established. The Medical Research Council was making a special investigation of the disease. There was nothing to show any connexion between catarrhal jaundice and public baths.

British Prisoners in Japanese Hands

In a statement to the House of Commons on Jan. 28 on Japanese treatment of British prisoners, Mr. EDEN said that in Siam many thousands of prisoners from the British Commonwealth, including India, were compelled by the Japanese military to live in tropical jungle conditions without adequate shelter, clothing, food, or medical attention. These men were forced to work on building a railway and making roads. Their health was rapidly deteriorating; a high percentage were seriously ill, and there had been some thousands of deaths. The number of such deaths reported by the Japanese was just over 100. The railway and roads concerned lead into Burma, and the conditions described applied throughout their length. One eye-witness reported of a camp in Siam: "I saw many prisoners clearly. They were skin and bone, unshaven, and with long matted hair. They were half-naked." The same witness reported that they wore no hats or shoes: and this in a tropical climate where there were practically no local resources which could provide medical or other material relief.

From Java came evidence which left no doubt that many of our prisoners were confined in camps with no adequate protection from malarial infection and lacking in proper provision for sanitation. Food and clothing provided was insufficient to maintain them in health. Reports from the northern area referred to the emaciated state of prisoners arriving from Java. In Hong Kong, Formosa, Shanghai, Korea, and Japan itself conditions generally were tolerable, although the scale on which food was provided was not adequate over long periods to maintain the health of prisoners. Conditions in Hong Kong appeared to be growing worse. In the transport *Lisbon Maru*, used to convoy 1,800 British prisoners of war from Hong Kong, the prisoners were seriously overcrowded. Many were undernourished. Many had contracted diphtheria, dysentery, and other diseases. There was no medical provision, and sanitary arrangements were virtually non-existent. The vessel was torpedoed. The Japanese kept the prisoners under hatches and abandoned ship. At least 800 prisoners lost their lives. The Japanese had violated the principles of international law. The replies of the Japanese Government to the protests of the British Government, through the Swiss Government, had been evasive, cynical, or otherwise unsatisfactory.

The Scottish Infant Mortality Report

On Feb. 1 Mr. BUCHANAN asked the Secretary of State for Scotland if he had considered the report of the committee presided over by Sir John Boyd Orr dealing with child mortality, and what action it was proposed to take. Mr. JOHNSTON: Yes, sir. On the day of publication I invited the associations of local authorities and other interested bodies to consider the report with a view to discussions which I propose to open immediately. Preliminary estimates indicate that the infant mortality rate, while still unsatisfactory, is likely to be lower in 1945 than it has ever been in Scotland.

MR. BUCHANAN asked if there was any reason for not discussing this report, and if the Minister consulted with only one or two authorities. Mr. JOHNSTON said it was not one or two authorities. He had invited associations of local authorities, which covered them all, to consider the report. It was not being ignored. It was published as early as possible, and he drew the attention of the associations of local authorities to it on the date of publication.

Later in the day Mr. BUCHANAN asked the leader of the House if it would be possible to have time to discuss the report. Mr. EDEN said he had gone into this matter and found that it would be discussed on the adjournment in about a fortnight. That would give only a brief opportunity, and he had consulted the Secretary for Scotland, who felt, like the Government, that this was a matter on which they should seek to give opportunity for full discussion. He could not say, there and then, how it would be contrived, but it was the Government's wish that the report should be discussed. Perhaps Mr. Buchanan would allow the Government to make the necessary arrangements in the ordinary way.

Mass Radiography Unit for Liverpool.—Replying on Jan. 27 to Mr. Kirby, Mr. WILLINK said he hoped to provide a mass radiography unit for Liverpool early in May. The proportion of persons examined by mass radiography who were found to require institutional treatment was very small. He was not aware that Liverpool Corporation foresaw difficulty in this connexion in the near future, having regard to the measures now being taken to increase the city's present accommodation for tuberculosis cases.

Light Diet of Dysentery Patients in Italy.—On Feb. 1 Colonel GREENWELL asked the Secretary of State for War if he was aware that the provision of light diet at base hospitals in Italy was insufficient for patients suffering from gastric disorders or from dysentery, and if, to rectify this state of affairs, he would consider having the relatively small quantities of foodstuffs required supplied regularly by air. Sir JAMES GRIGG: I am glad to say that the incidence of dysentery and gastric disorders in this theatre of war has been very low in recent months. It has been difficult at times to maintain an adequate supply of fresh eggs, but I do not know that there has been any other difficulty in providing suitable light diets for patients in base bospitals.

The Services

The *London Gazette* has announced the award of the M.C. to Lieut. (War Subs. Major) A. K. Dougall, Capts. D. W. Forgan (since killed in action), P. McL. Gunn, and J. W. T. Pretsell, R.A.M.C., and Capt. H. W. Chestnut, R.C.A.M.C. (attached R.A.M.C.) in recognition of gallant and distinguished services in Italy.

Col. (Temp.) G. A. Walmsley and Capt. L. MacD. Reid, R.A.M.C., have been mentioned in dispatches in recognition of gallant and distinguished services in North Africa, and Capt. H. C. Duncan, I.M.S. (seconded I.A.M.C.), in recognition of gallant and distinguished services in Burma and on the Eastern Frontier of India.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Capt. L. M. Kelly, I.M.S. (seconded I.A.M.C.) in recognition of gallant and distinguished services in Burma and on the Eastern Frontier of India.

Acting Surg. Cmdr. D. R. Goodfellow has been awarded the R.N.V.R. Officers' Decoration.

CASUALTIES IN THE MEDICAL SERVICES

Wounded.—War Subs. Capts. A. F. Crook, B. S. Lush, J. A. L. Naughton, and G. H. Pickering, R.A.M.C.

Died of Wounds.—War Subs. Capt. W. H. Lang, R.A.M.C.

Killed.—Capt. D. R. Harbison, War Subs. Capt. J. L. Shanks, R.A.M.C.

Prisoners of War.—War Subs. Capt. D. O. Davies, Acting Major G. H. Garlick, Temp. Lieut.-Col. W. G. Harvey, War Subs. Capt. E. Leigh, War Subs. Capt. B. Lennox, War Subs. Capt. J. D. Lodge, War Subs. Capt. B. Mayne, Capt. E. A. Smyth, Acting Major F. L. Webster, R.A.M.C.

Died.—War Subs. Capt. E. M. Gamble, R.A.M.C.

No. 3

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Jan. 22.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944 (a)	(b)	(c)	(d)	(e)	1943 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	70	4	19	3	1	92	8	27	1	4
Deaths		—	1				2	—		
Diphtheria	712	33	174	110	51	998	58	233	99	24
Deaths	10	—	9	1	—	19	1	6	4	1
Dysentery	148	41	69	1	1	113	11	25	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	1	—	—	—	—	2	—	1	—	—
Deaths		—					—			
Erysipelas			49	15	4			60	16	2
Deaths		—					—	—		
Infective enteritis or diarrhoea under 2 years				10					18	
Deaths	46	7	8	16	7	37	—	8	6	2
Measles	661	118	138	212	1	11,827	750	375	6	38
Deaths	—	—	—	7	—	16	—	1	1	—
Ophthalmia neonatorum	65	5	22	—	1	69	4	24	—	2
Deaths										
Paratyphoid fever	2	1	4	—	—	1	—	2	—	—
Deaths	—	—	—	—	—		—	—	—	—
Pneumonia, influenzal*	1,122	141	30	21	3	1,404	86	22	5	6
Deaths (from influenza)	143	16	4	6	—	100	13	6	2	1
Pneumonia, primary			300	30				316	22	
Deaths		85		19	17		—		23	12
Polio-encephalitis, acute	1	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	5	—	—	1	—	3	—	3	8	—
Deaths		—					—	—		
Puerperal fever		5	14		—	—	2	12	3	—
Deaths										
Puerperal pyrexia†	181	11	16		5	187	16	19	—	3
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	2,110	157	186	31	99	2,203	158	361	38	57
Deaths	1	—	—	—	—	1	—	2	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	2	1	—	5	—	7	1	2	3	1
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough	2,215	178	233	74	22	1,841	133	129	120	8
Deaths	15	—	1	2	—	12	1	2	6	—
Deaths (0–1 year)	453	59	80	69	28	440	51	80	66	30
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,841	935	698	258	167	5,832	1,046	730	280	150
Annual death rate (per 1,000 persons living)			16·0	16·8	‡			16·5	18·4	‡
Live births	6,515	865	888	364	252	6,251	797	949	383	286
Annual rate per 1,000 persons living			18·1	23·8	‡			19·4	25·2	‡
Stillbirths	252	27	31			249	17	46		
Rate per 1,000 total births (including stillborn)			34					46		

*Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

†Includes puerperal fever for England and Wales and Eire.

‡Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week the common infectious diseases of childhood rose in incidence: scarlet fever by 363 cases, whooping-cough by 192, measles by 102, and diphtheria by 39. There were 172 fewer cases of acute pneumonia, and 27 fewer of dysentery.

The deaths from influenza in the 126 great towns were 54 fewer than in the preceding week. The decline in Greater London, from 61 to 54, was less noticeable than elsewhere.

The rise in the incidence of scarlet fever was general, but was largest in Lancashire 51, and Yorks West Riding 62. Notifications of whooping-cough were, however, more localized; the largest increases were in Middlesex 55, Warwickshire 36, Yorks West Riding 32, and Essex 28. The rising trend of measles was mainly in the south, especially in Sussex with an increase of 55. The decline in the notifications of pneumonia was general throughout the country; the greatest decrease was in Lancashire 31, but in marked contrast to the general fall there was a rise of 36 in London.

The outbreaks of dysentery were concentrated in and around London. The largest centres of infection were London 41, Sussex 14, Surrey 12, Middlesex 11, and Lancashire 18.

Scotland reported a lower incidence for measles by 69, acute primary pneumonia by 57, scarlet fever by 43, and whooping-cough by 19, but dysentery notifications were up by 30 and diphtheria by 16. The increase in diphtheria was confined to the eastern and south-eastern areas. Two outbreaks of dysentery were reported during the week: Ayr County 12, and Dunbarton County 11. Dysentery in Edinburgh fell from 13 to 7 cases, but rose in Glasgow from 9 to 14.

In *Eire* measles notifications went up from 71 to 212: Dublin C.B. 94 cases, and Dublin North R.D. 100 (in an institution). Diphtheria (4 cases more) was notified from forty-two areas, and whooping-cough (22 cases more) from only six areas.

In *Northern Ireland* the incidence of diphtheria and scarlet fever remained high. The principal centres of infection were for scarlet fever, Belfast C.B. 64, and for diphtheria, Londonderry C.B. 17. There were 9 cases of diphtheria in a mental hospital in Omagh.

Health Education

The *Pharmaceutical Journal* for Jan. 1 contains Ministry of Health Bulletin No. 1, the first of a quarterly series the aim of which is to use the men and women in Britain's 15,000 chemists' shops as "missionaries for health." The idea is to tell the pharmacists of the country the why and the wherefore of official health campaigns, in the hope that they will play a part in educating the public. The first bulletin, which has a foreword by Sir Wilson Jameson, contains an article by Col. L. W. Harrison on venereal disease and another on droplet infections by Dr. W. H. Bradley.

Week Ending January 29

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,928, whooping-cough 2,104, diphtheria 777, measles 919, acute pneumonia 1,079, cerebrospinal fever 60, dysentery 176, paratyphoid 4, typhoid 2. In the great towns 104 deaths were attributed to influenza.

An appeal on behalf of the Princess Tsahai Memorial Hospital Fund has been signed, among others, by Sir Farquhar Buzzard, Lord Moran, P.R.C.P., Sir Alfred Webb-Johnson, P.R.C.S., Prof. Charles McNeil, P.R.C.P.Ed., Mr. J. W. Struthers, P.R.C.S.Ed., and Prof. John A. Ryle. During the years 1936–41 the Emperor of Ethiopia lived in this country: his daughter, Princess Tsahai, undertook training as a nurse at the Great Ormond Street Hospital for Sick Children, and after passing the examinations qualifying her to become a State-registered nurse she entered Guy's Hospital for further training. Her object was to fit herself to lead the movement for a modern medical and nursing service in Ethiopia, after its freedom had been restored. When this time came she returned to her country with the nucleus of the organization she intended to create, but her work was stopped by her illness and death at the age of 22, on Aug. 17, 1942. The present appeal is for funds to found in Ethiopia a hospital with medical school, library, and ambulance services in memory of the Princess Tsahai, and as a token of good will to Ethiopia from the people of Great Britain. It is hoped that those who are engaged in our own health and hospital services will help in this work, and that their gifts may be commemorated in some special part of the hospital. Donations may be sent to the hon. treasurer, Lord Horder, c/o Messrs. H. Reynolds and Co., 9, Greenhalgh Walk, London, N.2.

Medical News

It is proposed to hold the Annual Congress of the Ophthalmological Society of the United Kingdom on Friday, March 31, and Saturday, April 1, at the Royal Society of Medicine, Wimpole Street, W. There will be two subjects for discussion: the first, at the Friday morning session, is "Ocular Psychoneuroses (excluding Miner's Nystagmus)," and will be opened by Mr. R. C. Davenport and Squad. Ldr. J. H. Doggart. The second, at the Saturday morning session, is "Virus Affections of the Eye," and will be opened by Prof. A. Sorsby and Dr. C. H. Andrewes. Part of the Friday afternoon session will be devoted to a joint clinical meeting with the Ophthalmological Section of the Royal Society of Medicine.

A paper on "The Art of Cooking Vegetables" will be given before the Royal Society of Arts, John Adam Street, Adelphi, W.C.2, by Miss Phyllis L. Garbutt, A.I.C., on Wednesday, Feb. 16, at 1.45 p.m.

The "Radio Doctor" will deal with "What is Immunization?" in his broadcast talks in the "What is it?" series in the B.B.C. Home Service at 7 p.m. on Sunday next, Feb. 13.

A Diagnosis Section meeting of the Faculty of Radiologists will be held at 32, Welbeck Street, W., on Saturday, Feb. 19, at 10 a.m., when there will be a discussion on lung abscess.

The following meetings of the British Institute of Radiology will take place at 2.30 p.m. in the Reid-Knox Hall, 32, Welbeck Street, London, W.: Friday, Feb. 18, meeting of medical members. Saturday, Feb. 19, ordinary meeting, at which Dr. Norman P. Henderson will read a paper on the value of the opaque enema and its modifications.

A sessional meeting of the Royal Sanitary Institute is to be held at Bournemouth on Feb. 19, when the morning will be devoted to papers on "Health Education at Infant Welfare Centres and War-time Nurseries" by Dr. Vida Stark and on "Food Hygiene of Hotels and Restaurants" by Mr. W. Riley, senior sanitary inspector of Bournemouth. After lunch, which is at the invitation of the Mayor and Corporation, there will be a visit to Linford Sanatorium, near Ringwood. Further information may be had from the hon. local secretary, Dr. H. Gordon Smith, Town Hall, Bournemouth.

An extension of the Limb-fitting Centre at Queen Mary's (Roehampton) Hospital will be opened on Tuesday, Feb. 22, by His Excellency the Chinese Ambassador, Dr. Wellington Koo. After the Minister of Pensions has expressed thanks to the Governors for providing the extended building Dr. R. Langdale Kelham will show a film, with commentary, and there will be a demonstration by patients of the use of artificial limbs.

At a meeting of the Eugenics Society on Tuesday, Feb. 22, at 5.30 p.m., in the Rooms of the Royal Society, Burlington House, Piccadilly, Mr. B. S. Bramwell will give an address on "The Order of Merit: the Holders and their Kindred."

Twelve clinical demonstrations in neurology in connexion with the course of instruction for a diploma in psychological medicine will be given at Maida Vale Hospital for Nervous Diseases, London, W.9, at 3 p.m., on Feb. 29; March 9, 16, 23, and 30; April 4, 13, 20, and 27; and May 11, 18, and 25. The fee for the series is three guineas, paid in advance, cheques being made payable to the London County Council and forwarded to Dr. W. W. Kay, acting hon. director of the Maudsley Hospital Medical School, Central Pathological Laboratory, West Park Hospital, Epsom, Surrey, to whom all inquiries regarding the course should be addressed.

The following meetings of the Royal Sanitary Institute will be held next month at 90, Buckingham Palace Road, S.W.1, at 2.30 p.m. On March 1 Mr. P. G. Shute will read a paper on "Indigenous Malaria and Mosquito Control in England after the War"; on March 15 Sir William Savage will open a discussion on "Current Questions of Milk Supply"; and on March 28 Mr. A. Longworth will speak on "Rational Design of House Plumbing."

The Association of Scientific Workers (Hanover House, 73, High Holborn, W.C.1) announces that Prof. P. M. S. Blackett, F.R.S., has been appointed its president from Feb. 1, 1944.

Mr. W. C. W. Nixon has been appointed Medical Representative to the British Council in Turkey.

The prices of all brands of unmodified and modified insulin are to be reduced on Feb. 14, when a new schedule of prices will come into operation.

A new Order prohibits nurses in mental hospitals and institutions in Scotland from leaving their employment without the consent of the employing authority. This brings practice in Scotland into line with that in England and Wales.

Dr. T. Chalmers Borthwick, late of Ichang, China, has been reported a prisoner of war in Japanese hands.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Secretary of the Journal Board, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Members' subscriptions should be sent to the Secretary of the Association.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London*; SECRETARY, *Medisecra Westcent, London*. ADVERTISEMENTS, *Articulate Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Post-partum Haemorrhage

Q.—*Post-partum haemorrhage seems to be much more frequent lately, even after easy labour. Several of my colleagues with whom I have discussed this matter are of the same opinion. (1) Is there any explanation? Could it be due to deficiency of diet? (2) Can any measures be suggested which might be adopted during pregnancy to lessen the risk of such an alarming event? (3) Intravenous ergometrine has been found an excellent remedy, but is no longer obtainable. Is it safe to give pitocin intravenously in urgent cases? What dose is advised?*

A.—Reference to the statistics of a maternity hospital dealing with over 3,000 "district" and "in-patient" deliveries per annum does not reveal any significant change in the incidence of post-partum haemorrhage during the last ten years. (1) If there is an increase, dietetic deficiency is an unlikely cause. The degree of malnutrition would have to be gross. An increased use of anaesthetics should be borne in mind as a possible explanation. (2) Prophylactic measures recommended are: calcium lactate 30 to 40 gr. daily during the later months of pregnancy; quinine hydrochloride 1 gr. t.d.s. during the last 2 to 3 weeks of pregnancy; pitocin 0.25 c.cm. intramuscularly; or stilboestrol 0.5 mg. by mouth twice daily for 1 to 2 weeks before delivery. (3) Pitocin may safely be given intravenously in a dose of 0.1 to 0.2 c.cm. (1 to 2 units). In emergency, as much as 5 units has been given without ill effect, but so large a dose involves the risk of reaction, because pitocin is not entirely free from vasopressor factor.

Effect of Cervicectomy on Pregnancy

Q.—*A patient aged 35 already has two children aged 9 and 7. After the birth of the second child she had the following operation—amputation of cervix and anterior colporrhaphy for cystocele. No further pregnancies were considered owing to poor general health. She is now much improved and anxious to have another child. Is it correct that the chances of pregnancy are much less after such an operation, and that, should she become pregnant, early interruption—abortion or premature labour—is likely? Is recurrence of cystocele probable?*

A.—Conception is not impaired by a previous plastic repair if this has been wisely and skilfully performed. If a high amputation of cervix has left the patient with practically no vaginal cervix then there is an increased risk of early abortion. This risk could be minimized by taking special care during the week of the suppressed period for the first 3 to 4 months: excessive weariness, travelling, strong purges, and intercourse should be avoided. The injection of 5 mg. of progesterone would also be helpful once or twice during this week. If in the second stage of labour an episiotomy is performed, a great deal of the tension on the previous repair is relieved and the chance of recurrence is correspondingly reduced. To summarize: if a prolapse has been effectively repaired there is no reason why a subsequent pregnancy should not occur and end satisfactorily.

Fröhlich's Syndrome

Q.—*What is the best line of treatment for a girl of 11½ years suffering from Fröhlich's syndrome?*

A.—The triad of Fröhlich's syndrome is adiposity, failure of sexual development (primary and secondary sexual characteristics), and dwarfism. The diagnosis, however, can be correctly made if only the first two features are present. Very often, however, the diagnosis is incorrectly made when adiposity is the only feature and sexual development is normal, slightly delayed, or (especially in the case of the boy) obscured by adiposity. It is difficult to diagnose Fröhlich's syndrome in a girl of 11½ years, since puberty may not occur in normal individuals until a later age than this. Where sexual development is lacking, it may be stimulated by gonadotropic hormone. In

the male, pregnancy urine extract is effective. In the female, this would be combined with the follicle-stimulating hormone of pregnant mare's serum, or with the follicle-stimulating hormone of bovine pituitary glands. The adiposity is treated on the usual lines, with diet and thyroid. Should dwarfism be a feature, pituitary growth hormone is advisable if the epiphyses are ununited.

Mixing Pertussis Vaccine and Diphtheria Prophylactic

Q.—*I am using the pertussis vaccine (forte) for immunizing infants against whooping-cough. Since this is carried out at about the same age as the immunization against diphtheria, is there any objection to mixing the pertussis vaccine and the A.P.T. together in the same syringe and giving it as one injection? I am using the dosage suggested by you—viz., three injections of 1.0, 1.0, and 2.0 c.cm. of 20,000-million-organisms-per-c.cm. vaccine with a week's interval between the first and second injections and a month between the second and third. If the vaccine and A.P.T. can be mixed, the A.P.T. could be incorporated in the second and third injections (giving a month's interval) and thus avoid two further injections.*

A.—But is immunization against pertussis best carried out at the same time as against diphtheria? Pertussis attacks and kills many babies in the first few months of life; therefore immunization should be begun early. On the other hand little diphtheria is recorded under the age of twelve months; and, moreover, some children do not develop immunity satisfactorily if injected with diphtheria prophylactic much before their first birthday. Few authorities practise immunization of children against diphtheria until the twelfth, or at the earliest the ninth, month. On the point of mixing, it is probably true that prophylactics made in the same way and containing the same antiseptic may be mixed without loss of efficiency—e.g., T.A.B. and those founded on it. But it cannot be accepted that different prophylactics—e.g., a toxoid and a vaccine containing different antiseptics—can be mixed for a short or longer time before injection with perfect safety and without the possibility of some unexpected effect on the prophylactics. (Bousfield has called attention to this point.) The reputable manufacturer, to be sure of his ground, would mix the two prophylactics—in this case diphtheria and pertussis—and then apply to the mixture the same tests for proof of protecting power as had been applied to the separate constituents. And that raises the question: What tests of protecting potency had been applied to the batch of pertussis vaccine? McFarlan and Elizabeth Topley in the November *Monthly Bulletin* of the E.P.H.L.S. report an investigation in which the pertussis vaccine used had *afforded no protection*. They suggest that the vaccine may have been inefficient or the dosage may have been too low; no data were available about its power to protect mice or produce antibodies in human beings. One would guess from the excellent figures for protection in several campaigns in the U.S.A. that at least some of the pertussis prophylactics used there would protect mice and produce antibodies. Until such vaccines are generally available in England perhaps the questioner would hold his hand.

A Complicated Case

Q.—*A lady aged 65 has had rheumatoid arthritis for some 10 to 15 years, mainly in the fingers, wrists, toes, and knees. A few years ago I found she was also suffering from pernicious anaemia. This has much improved with intramuscular liver injections. In the past month she has developed severe pruritus ani and vulvae, spreading down the inner side of the legs, and recently she has become more sensitized—with areas of dermatitis on the thighs and arms. I have tried her on various remedies. Would oestrogen help? There is no local cause to be found in the anal canal or vagina. She has no vaginal discharge; urine is normal—no sugar, no albumin.*

A.—The answer to this question can be divided into three separate items: (1) Rheumatoid arthritis and pernicious anaemia, it may be assumed, must have some effect on the other states, but only indirectly. (2) Pruritus vulvae et ani is usually responsive to small doses of *x* rays. (3) The dermatitis or eczema will best be relieved by rest and simple local applications, such as ichthyol 2% in oily calamine. Some form of sedative is called for. Oestrogen treatment may be tried, although there is no constructive indication for its use. This case appears to present one of those complex and difficult problems where the practitioner can often plan out treatment by drawing up a sort of schedule on a sheet of paper and working out separately the symptoms and their remedies.

Ergotamine Tartrate for Migraine

Q.—*What is the mode of action of ergotamine tartrate in removing the headache of migraine? Is it useful for other forms of headache? Is there any danger in long-continued use or increase of dosage? I have used it by injection as the oral route is not effective.*

A.—It seems likely that ergotamine tartrate removes the headache of migraine by causing vasodilatation in the cerebral blood vessels, which results in increased cerebral blood flow. Whereas ergotamine causes vasoconstriction in vessels elsewhere in the body, workers in Heymans's laboratory in Ghent showed that in the head ergotamine caused vasodilatation. Ergotamine tartrate is now known to be useful for other forms of headache. There is danger in too frequent use of the drug, for it causes gangrene of the extremities. It was formerly used in obstetrics, and cases are on record in which its administration was accidentally continued for a long period and resulted in gangrene. It is impossible to say what intervals should elapse between doses—probably a week. Ergotamine is not inactive by mouth, but the onset of its action by mouth is slow and gradual, the earliest effect appearing 20 minutes after the drug is taken.

"Bowel-consciousness"

Q.—*Why does the tongue get furred in the constipated?*

A.—In a healthy subject who is constipated there is no furring of the tongue. Many conditions, ranging from minor visceral neuroses and dietetic indiscretions to acute fevers with dehydration and gastro-enteritis, may be responsible for the association, but the furred tongue is no more the result of the constipation than the constipation is the result of the furred tongue. The successful propaganda of patent medicine firms has made the public over-conscious of its bowel habits, and the poor appetite and unpleasant gastro-intestinal symptoms of many patients with constipation are tributes to its powerful influence in provoking a psychosomatic disorder. If doctors and nurses were to make a determined effort to defeat the ill effects of these unfortunate advertisements there would probably be far fewer people who "suffered" from constipation.

Destruction of Vitamin C

Q.—*(1) How is it that the rather prolonged boiling of fruit in making jam does not destroy vitamin C? Is it that vitamin C is not so easily destroyed by heat as we used to believe? (2) Is it the case that fruit bottled by ordinary domestic methods retains its vitamin C content? (3) Can you recommend any publications giving up-to-date information on the present knowledge of vitamins in a compact and practical form useful to general practitioners and dietitians?*

A.—The stability of natural vitamin C in ordinary domestic cooking is now known to be much greater than was previously believed. For instance, in the cooking of leafy vegetables by boiling, or in the stewing of fruits, although extraction into the cooking liquor is usually of the order of 50%, destruction of the vitamin is frequently less than 10%. It must be remembered that in all boiling, stewing, and bottling processes oxidation by direct contact of the material with air is largely prevented by the protective layer of steam produced in the cooking process. Oxidation of vitamin C is, however, accelerated if (1) the enzymes present in the fruit or vegetables are liberated (for instance, by damage to the plant tissue before use) and allowed to act before being destroyed by heat; (2) free access of oxygen is permitted while the material is still hot (as shown by the rapid destruction of the vitamin when vegetables are "kept hot"); (3) cooking is carried out in a markedly alkaline medium (this is unusual in domestic practice even when soda is used for green vegetables); or (4) contamination with metallic ions such as iron or copper occurs. In making jam it is possible to control all the above factors so that the destruction of vitamin C is negligible, but if such control is not exercised, then naturally a proportional loss of the vitamin is to be expected. Similarly, it is possible to retain a high percentage of the vitamin C content of fruit on bottling by approved domestic methods.

While it is difficult to recommend publications on vitamins which are compact, practicable, and at the same time up to date, the following should be found useful: Harris, *Vitamins in Theory and Practice;* Fixsen and Roscoe, "Tables of the Vitamin Content of Human and Animal Foods," II (1940), *Nutrition Abstracts and Reviews;* Booher, Hartzler, and Hewston, *A Compilation of the Vitamin Values of Foods in Relation to Processing and Other Variants*: Circular No. 638, May, 1942, United States Department of Agriculture; Olliver, "Ascorbic Acid Values of Fruits and Vegetables for Dietary Surveys," *Chemistry and Industry*, 1943, vol. 62, No. 16, pp. 146–8; Harris, "Vitamins," *The British Encyclopaedia of Medical Practice.*

INCOME TAX

Accounts for Two Years: Contributions to War Damage

B. J. states that the practice audit was not done for two years, but the income-tax assessments were increased. Secondly, two houses are mortgaged; can a claim be made on the mortgagees for a share of the war damage contribution and income tax?

*** (1) The Income Tax Acts assume that yearly accounts are prepared and do not provide for cases where the account covers two years. B. S. should get in touch with his inspector of taxes and suggest that the adjusted profit shown by the two-years account should be regarded as earned evenly over the two years and the income-tax assessments adjusted on that basis.

(2) The position as regards war damage contributions depends on several conditions. These are set out in a pamphlet (known as Form W.D.7.) which can be obtained from the Regional Office of the War Damage Commission. Income tax can be deducted at the

standard rate from mortgage interest paid to a private concern. If it is paid to a building society the normal practice is for a deduction to be made from the tax assessed under Schedule A on the property to give the appropriate relief; the inspector of taxes can say whether this has been done.

"Pay as You Earn"

H. M. is assessed under Schedule E and has received a notice that the collector has been authorized to accept 5/6ths of the tax charged for the year 1943–4, because as from April 6 next he will be assessable under the new system on the current year's basis and pay tax currently by deduction.

*** This is correct. It is true that H. M. has been assessed for a year's income for each year of his employment and that at one time the assessments were on the current year's basis. But he has not yet accounted for tax on his earnings from April 5, 1943, and when April 5, 1944, is reached would normally be owing a further seven months' tax—the deductions for the 1943–4 tax having started in November, 1943. So H. M. will in fact benefit by the cancellation of seven months' tax, because once the deductions have started after April 5, 1944, he will be up to date instead of being seven months in arrears with his payments.

Post-war Credit

I. H. has received a notice, the final figures of which are:

	£ s. d.	£ s. d.
Earned income relief	19 7 0	
Personal allowance	20 0 0	
Amount of allowances ranking for post-war credit		39 7 0
Tax on above	£23 7 0 @ 6/6	= 7 11 9
	£16 0 0 @ 10/-	= 8 0 0
		15 11 9

He suggests he should not pay income tax on his post-war credit.

*** The figures are not perhaps set out as clearly as they might have been. What it is intended to convey is that £39 7s. is the amount *on which* the income-tax post-war credit is due, and that that credit is £15 11s. 9d.

Earnings of Married Woman

D. G. is married to a professional man. Last year she earned £89 4s. 6d. for part-time clinic work, and £18 19s. 10d. income tax has been charged on those earnings. It that correct?

*** We assume that D. G.'s husband has had the maximum earned income relief (10% on £1,500 = £150), and that the assessment is made as for the year ended April 5, 1943. On that basis the assessment should be:

	£ s. d.
Amount of income	89 4 6
Wife's earned income allowance	80 0 0
Balance	9 4 6
Tax @ 10/- in the £	4 12 3

(The special allowance for the wife's earnings was increased from £45 to £80 for the year ending April 5, 1943, and following years.)

LETTERS, NOTES, ETC.

Horse Transport and Diarrhoeal Diseases

Mr. JOHN FOLEY, B.Sc. (London, W.C.2) writes: While, as you point out in the editorial on the increase in diarrhoeal diseases among children during the war (Jan. 29, p. 155), there are many factors contributing to this increase, there is another which goes unnoted—the increased use of horses in the larger towns. It would be of interest if some statistician would compare the changes in the deaths due to diarrhoeal diseases with the reduced use of motor cars and the rise in the use of horse transport during these war years. It is clear from quite superficial study that the increased amount of horse dung deposited in the streets of the towns cannot, owing to labour shortages, be disposed of as quickly and effectively as the smaller peacetime quantity. The death rates have increased in just those places where there is the greatest increase in the change over from petrol to horse transport—i.e., the larger towns. Some years ago, before the war, I had occasion to meet many of the paediatricians attached to the London hospitals. There were often comments that the incidence of diarrhoea and vomiting in infants had fallen considerably since the virtual replacement of the horse by the internal combustion engine. Should some parallel be clearly shown in the suggested comparison, then the authorities would have to consider the lives risked and lost in the transport across the seas of fuel necessary to enable commercial users of horses to revert to mechanical power, and their value compared with those of the children dying from diarrhoeal diseases carried by flies breeding on the horse dung on the roads.

Hereditary Cold Fingers

Dr. E. C. CURWEN (Hove) writes: In the reply to a question on this subject in the *Journal* of Jan. 15 (p. 103) it is stated that drug treatment is unlikely to be effective. I have a patient who for the last 7 years has been on a regular daily dose of benzedrine (15 to 20 mg.) on account of constitutional lethargy and somnolence. Previous to taking this drug he used to suffer from numb, white, painful fingers when the body as a whole became chilled. During the time that the benzedrine has been administered there has been no return of the finger condition at all, though, curiously enough, he finds cold weather more difficult to endure than he did before.

Examining School-children

Dr V. V. BROWN (Bristol) writes: At the moment, when there is so much talk of education and of school medical services, I am very disturbed by information which I was given by a schoolmaster recently. He is on the staff of a school with 500 pupils, and he tells me that prior to the visit of the school medical officer the pupils' height, weight, and visual acuity are recorded by members of the teaching staff. Although I have the greatest admiration for the teaching profession, I feel sure that, even with the best of intentions, these records are not likely to approach the required standard of accuracy unless they are completed by a member of the medical or nursing profession. Is it reasonable to suppose that a schoolmaster would take the necessary care or that he would be sufficiently conscious of the importance of these records?

*** It is tentatively suggested by Dr. Margaret L. Foxwell in an article on the School Ophthalmic Service in *Public Health* (August, 1943) that school-teachers should carry out visual acuity tests because, among other reasons, they are most likely to "notice such habits as blinking, head tilting, periodic squints. . . ."

Backache and Renal Disease

Dr. E. WEATHERHEAD writes: In the article by four medical officers of the Air Services in the *B.M.J.* of Jan. 8, entitled "Influenza 'A': Account of a Minor Epidemic," the following rather surprising statement is made: "Severe low backache was experienced by two or three patients, and had there not been an epidemic of influenza *this might easily have been mistaken for a renal condition*" (italics mine). We are not told of any other symptoms in these patients suggestive of renal disease. Surely, backache—which is generally acknowledged to be the commonest of all symptoms, occurring in an extremely wide variety of conditions—takes a very minor place in renal disease except in "Newspaper Medicine" or advertisements in which the sufferer's attention is generally directed to his kidneys. The other, and far more important, symptoms and signs of nephritis or other form of kidney disease would at once enable the physician to distinguish the condition from influenza.

Speculation

Dr. A. N. MACBETH writes: Your inquirer (Nov. 20, 1943, p. 666) might be informed that the ordinary myxoedematous thyroid is refractory to thyrotrophic stimuli, the ordinary myxoedema being a primary failure at the thyroid level. Sharpey-Schafer finds that some cases of ordinary myxoedema show a residual response to the trophic factor, but this can be elicited only by very high doses. The myxoedema that occurs secondarily to pituitary depression is rarer, and it is to this type alone that his queries could be applied. A recent issue of the *Journal of Mental Science* refers to the occurrence of material increases of pituitary secretion of one kind or another following electrical convulsive therapy. Such increase may of course be confined to cases whose original output was low.

Unusual "Deficiency" Diseases in Barbados

Dr. M. LATTEY (St. Georges, Bermuda) writes: While working in Barbados I saw many deficiency diseases, and found two conditions which I have not seen described anywhere. I should like to know if anyone else has seen them. The first I have called "deficiency nephritis." I saw it only in children, and it is characterized by generalized oedema, and by large quantities of albumin and hyaline and granular casts in the urine. Hospitalization alone, on the usual hospital diet, had no effect on the disease, even after two weeks, but when thiamin chloride was given the condition cleared up in a few days. This was presumably a form of beriberi, differing in that I have never seen renal lesions described in beriberi. Albuminuria is seen in protein starvation, but if this were protein starvation it would presumably have been improved by the hospital diet. The second condition was a frequent accompaniment of the angular stomatitis of vitamin B deficiency, and consisted of sores at the end of the prepuce. These sores were similar in appearance to the sores at the corners of the mouth, were usually at the same stage of development, and were likewise healed by the administration of vitamin B complex. The Kahn test was negative in all cases in which it was done.